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ABSTRACT

This study aimed to synthesize the scattered sources of information available on the 3-year, technically oriented Fachhochschulen type of higher education in the Federal Republic of Germany. Organized into six sections, the book starts with a review of the organization of the higher education system including the trend towards a unitary system, the establishment of the comprehensives and the Fachhochschulen, institutional patterns, options for qualified school leavers, higher education objectives, and administrative and legal arrangements. The second section examines course content and organization including entrance qualifications and admissions, duration of studies, practical periods, certification, and curricular innovation. A third section seeks to assess the prestige of institutional types in particular the Fachhochschulen versus the universities. Section four provides a statistical overview in the form of tables with detailed explanation. The fifth section treats teachers in the Fachhochschulen as they compare to the staff at universities qualitatively, and with regard to career, status and duties beyond their major functions. The concluding section takes a look at the past and future of the Fachhochschulen, in particular the difficulties this type of higher education faces due to the societal environment in West Germany which continues to regard the traditional university education as best. (JB)

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Ulrich Teichler

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Ulrich Teichler

The First Years of Study at Fachhochschulen and Universities in the Federal Republic of Germany

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Preface

Debates on "short-cycle higher education", "non-university higher education" or "alternatives to universities" continue to be on the agenda both in policy debates and in research on higher education. For about three decades, we note a search for appropriate patterns of the higher education system due to changing abilities, inclinations and career prospects of students in the process of expansion of higher education. In addition concern revived recently in various European countries about a long duration of studies. Finally, the decision made by the European Community in December 1988 to consider successful completion of three-year-programmes in higher education as the general entry qualification to professions led to a reconsideration of institutional types and course programmes in higher education in Europe.

The last development certainly exerts some pressure on institutional patterns in France where two-years programmes are offered at Instituts Universitaires de Technologie. This study is a country report in the framework of a study commissioned to the European Institute of Education and Social Policy by the French Commissariat Général du Plan and the Ministère de l'Education nationale (see Jean-Pierre Jallade, ed.: Les Premières années d'enseignement supérieur dans la perspective de 1993. 2 vols., Paris: L'Institut Européen d'Education et de Politique Sociale, 1989-90).

Information on Fachhochschulen and other second types of higher education is relatively scarce as compared to that available on universities. Therefore, a compilation of the few scattered sources might be useful. This study aims to synthesize the information that was available until summer 1989.

The findings do not necessarily confirm widely held views about Fachhochschulen. For example, Fachhochschule graduates report less often than university graduates that they utilize the knowledge acquired during their studies on the job. Further research and other ways of improving the information base obviously is needed in order to substantiate rumors and believes shaping the current debates on this important sector of the higher education system.

The literature search and screening was supported by Peter Becker. Helga Cassidy and Kristin Gagelmann typed and corrected the camera-ready manuscript.

Contents

1.	The Organisation of the Higher Education System	9
1.1	The Trend towards a Unitary System until the Mid-Sixties	9
1.2	The Establishment of Fachhochschulen	11
1.3	Comprehensive Universities	13
1.4	The Present Institutional Pattern	14
1.5	Other Options for Qualified School Leavers	15
1.6	Objectives of the Various Types of Higher Education	18
1.7	Administrative and Legal Arrangements	20
2.	Course Content and Organisation	21
2.1	Entrance Qualifications and Admission	21
2.2	Duration of Studies	25
2.3	Course Programmes, Teaching and Learning	30
2.4	Practical Periods	36
2.5	Certification	38
2.6	Mechanisms of Curricular Innovation	40
3.	The Prestige of Institutional Types	43
3.1	Selection and Allocation of Students	43
3.2	The Selection Process	51
3.3	Employment Prospects of Graduates	56
4.	A Statistical Overview	67
5.	Teachers	89
5.1	Qualitative and Structural Overview	89
5.2	Career, Status and Function	95

6.	Past and Future of Fachhochschulen and the Pattern of the Higher Education System in the Federal Republic of Germany	101
6.1	The Development of Fachhochschulen during the First Decade	101
6.2	Current Status and Problems of Fachhochschulen	104
6.3	Future Prospects	107
Literature		109

1

The Organisation of the Higher Education System

1.1 The Trend towards a Unitary System until the Mid-Sixties

Higher education policy in the Federal Republic of Germany in the immediate post-war period had opted for a unitary system. Until the mid-1960s, emphasis was placed on blurring or revoking the previously existing institutional types (see the overview in Higher Education in the Federal Republic of Germany: Problems and Trends, 1966).

Until the 1950s, the term "university" was used only for those institutions of higher education which were research-oriented, offered more or less the full range of traditional academic disciplines (theology, humanities, economic and social sciences, law, natural sciences and medicine) and were entitled to grant both doctoral degrees and the *Habilitation*, i.e. a special dissertation and examination qualifying for professorial level academic positions at universities. In 1950, 18 universities of that kind existed in the Federal Republic of Germany. All four of the oldest universities - those in Heidelberg (founded in 1386), Freiburg (1457), Tübingen (1477) and Marburg (1527) - are located in relatively small towns in which the university shapes the town life in general.

Four institutions specialized in one academic discipline were originally called *Hochschule*, but considered university-level and subsequently renamed *Universität*: the Medical Academy Düsseldorf, the Veterinary College Hanover, the Agricultural College Hohenheim and the College of Economics Mannheim.

The 9 *Technische Hochschulen* founded between 1775 and 1879 have been officially considered equivalent to universities since the 1950s. Traditionally, engineering was not conceived to be an academic subject. At the beginning of the 20th century the *Technische Hochschulen* attained a more or less equal

status with the universities. In the late 1940s, the TH Berlin was renamed *Technische Universität Berlin*; most others were renamed correspondingly in the 1960s and 1970s, when other disciplines were added.

In 1950, these 31 university-level institutions accommodated more than 80 percent of students at institutions of higher education (see Peisert/Framhein, 1978). Additionally, 112 institutions of higher education existed which can be grouped into three categories: theological, teacher training and art colleges.

In addition to theological faculties of universities, there were 16 theological colleges (*Kirchliche Hochschulen*). "Some are remnants of former universities or of universities which had temporarily ceased to exist and were later re-founded. This is particularly so in the case of Catholic institutions. The Protestant colleges are of more recent origin, most of them having been established only in the course of the 20th century. Some of them came into being during the struggle of the Confessional Church against the National Socialist dictatorship" (Higher Education in the Federal Republic of Germany, 1966, p. 9).

Seventy-eight teacher training colleges (*Pädagogische Hochschulen*) existed in 1950 for the purpose of training teachers for the compulsory school system (teachers for academic secondary education were trained at universities). After World War I, full academic secondary education became a prerequesite for teacher training, and most German states upgraded former *Seminare* to teacher training colleges, whereas some states established two-year courses at universities; during the Nazi era, the entrance requirement of complete academic secondary education was suspended. After World War II, "most of the States resumed the development set in train during the 1920's" (ibid.). During the 1960s and 1970s, most of these institutions were incorporated into universities. In 1987, only nine separate *Pädagogische Hochschulen* remained (seven in Baden-Württemberg and two in Schleswig-Holstein). It should be noted that teacher training for compulsory schools continues to require less than four years of study (3 or 3 1/2 years) and is not considered to be full academic study. For example, graduates from those areas of teacher training are not entitled to become doctoral candidates, unless they pass additional examinations certifying equivalent achievement to that of a regular university degree.

Finally, 18 art colleges existed in 1950. They have remained a specific institutional type up to the present, numbering 28 in 1987. Most course programmes preparing for artistic careers in fine arts, design, music etc. and some course programmes preparing for teacher training in these areas are provided by those special institutions (see Rattemeyer/Vogel, 1987). In contrast to universities and *Fachhochschulen*, they administer entrance examinations testing artistic abilities. In many fine arts fields, courses are

minimally structured; their completion is certified after some period without any regular final examination and is not considered to be a degree.

Except for art colleges, the institutions named above were either grouped into *Universitäten* or *Wissenschaftliche Hochschulen* in descriptions of the higher education system of the Federal Republic of Germany. This terminology, which prevailed until recently, underscores joint characteristics of these institutions regarding close ties between research and teaching, the freedom of research on the part of the senior academic staff, as well as freedom of learning on the part of the students.

1.2 The Establishment of Fachhochschulen

Since the late 1950s, a need was felt to extend higher education in the face of both growing individual demand for higher education and growing demand on the part of the employment system for increased numbers of qualified labour (cf. Hüfner et al., 1977). This was in some part realized by the extension of existing universities. Student numbers at most universities quadrupled or grew even further between 1955 and 1980 (see Teichler, 1985, p. 59). In part, new universities were established. Of the 68 universities (including comprehensive universities) existing in 1987, 38 were founded after 1960, though most of them were not established completely new, but also incorporated previously existing teacher training colleges, theological colleges and in some cases higher vocational schools as well (see Wissenschaftsrat, 1980; Framhein, 1983; Framhein, 1986).

Since about the mid-sixties, however, a consensus emerged among educational planners as well as scholars that the increasing number of applicants could not be accommodated without changing the institutional pattern of the higher education system. It was generally assumed that expenses for higher education could not increase to the same extent as the growing student numbers and that new structures were needed in order to serve changes in the abilities and motivations of students as well as changes in the prospective careers of graduates. The first proposals for establishing a second type of higher education institutions were discussed since the early 1960s, and the idea of creating comprehensive universities was put forward in official planning documents for the first time in 1967 (see the overviews of these trends and discussions on higher education in Peisert/Framhein, 1978; Teichler, 1986a; Gieseke, 1987; Goldschmidt, 1989; Oehler, 1989).

In 1970, the Science Council, the highest advisory organ for higher education planning in the Federal Republic of Germany comprising of representatives of Federal and state governments, the higher education and research in-

stitutions as well as the general public, recommended the provision of structural patterns of institutions and course programmes according to which 60 percent of new entrant students in higher education were expected to enrol in course programmes at *Fachhochschulen* or in other short course programmes (Wissenschaftsrat, 1970; see the overview on this debate in Teichler, 1986b).

In 1968, the prime ministers of the states (*Länder*) of the Federal Republic of Germany signed a treaty agreeing to establish *Fachhochschulen* which finally were created in 1970 and 1971. Former engineering schools (*Ingenieurschulen*) and higher vocational schools (*höhere Fachschulen*), predominantly in economic fields and social work, were upgraded in order to raise the standard and reputation of these institutions as well as to ensure the international recognition of their graduates. Three years of study - whereby practical phases might be added - were considered the typical duration of course programmes at these institutions in contrast to four or more years at universities (see the overviews on *Fachhochschulen* in Gieseke, 1981; Wissenschaftsrat, 1981; Mönikes, 1988; Gellert, 1989).

Up to 1970, persons who had completed their compulsory education and apprenticeship training were, after a few years of employment, eligible to sit the admission tests of engineering schools and higher vocational schools. When those institutions were upgraded around 1970, formal educational prerequisites were raised: The *Fachhochschulreife* (the "maturity" required for study at *Fachhochschulen*) now requires the successful completion of the intermediate track of lower secondary education (of the *Realschule* after 10 years of schooling) and of two years at the newly established vocational high school (*Fachoberschule*) or the successful completion of the 12th grade of academic secondary education at the Gymnasium, whereas the *Abitur* leading to university education is conferred upon successful completion of the 13th grade and the final examinations taken in the 13th year (on secondary education and access to higher education see Max Planck Institute for Human Development and Education, 1983; Teicher, 1985; Mitter, 1987; Führ, 1989).

In 1987, the number of *Fachhochschulen* was 99. Whereas more than 50,000 students each are enrolled in the largest universities and about 15,000 on average in a university, *Fachhochschulen* accommodate about 3,000 students on average. In the case of the largest *Fachhochschule* (FH Köln), 15,600 students were enrolled in 1987 (see Bundesminister für Bildung und Wissenschaft, 1988, pp 324-352). One should bear in mind that a substantial part of *Fachhochschulen* is specialised in one major disciplinary area.

Around 1980, Federal and state governments established *Verwaltungsfachhochschulen* for the training of the second rank of the public administration and service sector predominantly in non-technical fields, i.e. public administration, library sciences, training of personnel for employment agencies, etc.

(see Brinckmann et al., 1980; Bunge, 1985). These institutions were to provide course programmes equivalent to general *Fachhochschulen*, but with two notable differences. First, only persons who have been given a contract by a public agency are entitled to enrol. Second, the total study and training phase lasts three years: 18-24 months at college, and 12-18 months on-the-job training. In 1987, 24 of these institutions had a total enrolment of 35,000 students.

1.3 Comprehensive Universities

Merging all institutions of higher education into comprehensive universities (*Gesamthochschulen*) where feasible (within the regional institutional setting) became a very popular idea in the late sixties and early seventies. Around 1970, all major parties and most of the major societal groups concerned agreed upon the concept of comprehensive higher education wherein all universities, *Fachhochschulen* and other institutions of higher education should be institutionally merged into comprehensive universities (see Cerych et al., 1981; Hermanns et al., 1983). The major proponents of comprehensive higher education suggested that students both from the academic secondary education track and those from higher vocational schools (*Fachoberschulen*) should jointly attend courses at comprehensive universities. Two models of the so-called *Integrierte Gesamthochschule* were finally realized. These were the *Konsekutiv-Modell*, in which both groups of students take part in a joint course programme up to the first degree which is at least equivalent to a *Fachhochschule* degree, although the course programme is somewhat closer in its curricular thrust to that of universities. The students could then continue their studies up to a second degree which would be equivalent to the university degree. The second model, known as the *Y-Modell*, allows all students to take part in a joint introductory programme of at least one year, and then split into short-cycle or long-cycle programmes. Those reluctant to realize curricular integration accordingly favoured the establishment of the so-called *kooperative Gesamthochschule* which were to retain separate course programmes within one institution, but establish joint bodies in order to reduce the gaps between their course programmes and to ease transfer; this institutional model also was expected to be instrumental in saving costs by sharing resources.

The Framework Act for Higher Education (*Hochschulrahmengesetz*) - a Federal legislation enacted in 1976 providing guidelines for legislation on state (*Länder*) level where the supervisory power for higher education rests - formulated a common goal for higher education institutions allowing for nuances of goals of the different types of institutions. Also, according to the 1976 Framework Act, the comprehensive university was the preferred future insti-

tutional model for higher education. In practice, however, only 11 comprehensive universities were founded in the seventies, none of which incorporated a previously existing university. The official statistics in 1987 name seven comprehensive universities, six of which had established integrated courses for a substantial part of their course programmes - at five institutions predominantly according to the "Y-Modell" and at a single institution according to the consecutive model.

The 1985 revised version of the Framework Act for Higher Education no longer calls for comprehensive higher education as a future model (cf. Bundesminister für Bildung und Wissenschaft, 1986). Though the common phrasing of the tasks of higher education institutions is upheld, higher education in the Federal Republic of Germany is now structured according to two major types of institutions and two corresponding major types of course programmes and degree levels supplemented by a small sector of specific institutions and specific course programmes (cf. the typology in Teichler, 1988b, pp. 34-61).

1.4 The Present Institutional Pattern

In 1987, the total number of institutions of higher education in the Federal Republic of Germany was 244. As Table 1 shows, there were

- 61 universities,
- 7 comprehensive universities,
- 16 theological colleges,
- 9 teacher training colleges, and
- 123 *Fachhochschulen*, among them 99 general *Fachhochschulen* and 24 *Verwaltungsfachhochschulen* (*Fachhochschulen* for public administration).

About half of the new entrant students was enrolled at universities in regular university-type course programmees, and about a third in course programmes of *Fachhochschulen* or *Verwaltungsfachhochschulen*. Almost a sixth finally was enrolled in course programmes not fitting the predominant dichotomy: those programmes in teacher training which require less than four years, course programmes at art colleges not leading to typical degrees, and integrated course programmes of comprehensive universities.

Table 1
Institutions of Higher Education in the Federal Republic of Germany 1960-1988

Type of institution	1960	1965	1970	1975	1980	1985	1988
Universities (including technical universities and special universities)	33	34	41	49	55	59	61
Theological seminaries	17	17	14	11	11	15	16
Teachers colleges	52	54	51	19	13	10	8
Art academies	24	26	26	26	26	26	29
Comprehensive universities	-	-	-	11	9	87	
Fachhochschulen*	-	-	98	97	115	122	122
Total	126	131	230	213	229	241	243

Source: Statistics published by Federal Ministry of Education and Science.

* Since 1975 including Verwaltungsfachhochschulen (FH for public administration).

1.5 Other Options for Qualified School Leavers

Up to the early 1970s, more than 90 percent of those completing a type of secondary education which entitles to enrolment in higher education institutions actually enrolled. According to data provided by the Federal Statistical Office, 58.7 percent of those secondary school leavers in 1972 enrolled at institutions of higher education during the same year, and altogether 91.8 percent of them enrolled within the first three years after successful completion of one of the corresponding types of secondary education. Of the qualified secondary school leavers in 1980 only 31.4 percent enrolled in the same year and altogether only 64.8 percent within three years. In 1986, the percentage of those immediately transferring from secondary to higher education even declined to 24.2 percent (see Wissenschaftsrat, 1988, p. 293). According to regularly conducted longitudinal surveys, 83 percent of the qualified secondary school leavers in 1976 eventually - within five or even more years - enrolled; the authors estimate an eventual study quota of 70 percent among the qualified school leavers in 1986 (Lewin et al., 1988, p. 14).

The major option for those qualified school leavers not turning to higher education institutions is the sector of vocational training (see various surveys in Kaiser et al., 1985a). It would be misleading to call this a post-secondary education sector, for hardly any of those vocational training programmes and schools require completion of the *Abitur* at the *Gymnasium* or completion of *Fachoberschule* for entrance, and young persons taking part in these programmes typically are not older than college-bound upper-secondary school students. Vocational training (*Berufsausbildung*) considered to be complete comprises at least two years of training and leads at least to a skilled worker qualification. Training is provided either in the "dual" version, whereby predominant on-the-job training is supplemented by part-time vocational training, or in a predominantly schooling version supplemented by practical phases - the latter prevailing in higher vocational school. Of all young people taking part in vocational training (not including short programmes not leading to complete qualifications) in 1980, 6.8 percent were qualified to enrol in higher education. This quota increased to 12.7 percent in 1986 (see Wissenschaftsrat, 1988, p. 282). Among apprentices in banking (*Bankkaufmann*) and insurances (*Versicherungskaufmann*), nowadays more than 50 percent had completed secondary education qualifying for enrollment in higher education.

Also, some qualified secondary school leavers transfer to training schemes for the "intermediate service" (*mittlerer Dienst)* of the public sector. They are open to those having completed the *Realschule* and possibly a higher vocational school as well.

Special training schemes in industry for academic secondary school leavers are predominantly provided in business studies. Altogether, about 8,000 of those training places are offered annually (Kramer, 1986). Three years of training are required as a rule.

The total number of students at *Berufsakademien* (vocational academies) and schools not considered higher education institutions but exclusively established for young people having completed academic secondary education is less than one percent of those enrolled at *Fachhochschulen* (Gellert, 1989, p. 15). Vocational academies - state institutions which provide three-year programmes, about half of which is practical training at an enterprise - were first founded in 1974; only two states (Baden-Württemberg and Schleswig-Holstein) have established this institutional type.

Of the qualified school leavers in 1976, 26 percent turned to vocational training within the first 4 1/2 years; among those completing the corresponding types of secondary education in 1983 the respective quota was 39 percent (Durrer and Minks, 1989, p. 15). According to the corresponding survey on qualified secondary school leavers six months after completion of secondary education, 31 percent of them transferred in the same year to vocational trai-

ning, among them 22 percent to the "dual system", 6 percent to (higher) vocational schools and three percent to civil service training schemes (Lewin et al., 1988a, p. 13).

Table 2
Studies and Training Started and Completed by Qualified Secondary School Leavers 1976-83 within a Period of 4 1/2 years after Completion of School (percentages)

Education/training started or already completed	1976	1978	1980	1983
Began studies	80	76	76	69
Completed studies of which:	13	9	7	6
Fachhochschule diploma[2]	8	6	5	5
Teacher training	4	2	2	0
Other degrees	1	1	0	1
Began vocational training	26	32	29	39
Completed vocational training of which:	21	27	24	33
Apprenticeship training	12	16	14	22
Higher vocational school	3	4	3	4
Health training school	2	2	2	3
Berufsakademie	1	1	1	1
Fachakademie	0	0	0	0
Civil service training	3	4	4	3

Source: Durrer/Minks, 1989, p. 15

1 Including those dropping out later

2 Excluding those completing Fachhochschule of public administration

As regards successful completion of vocational training, Table 2 shows that among the 1983 qualified secondary school leavers

- 22 percent had completed a vocational apprenticeship training in the "dual system" (66,000 persons according to the estimate of a sample survey),
- 7 percent (21,400) completed higher vocational schools, among them 3 percent in the health sector,
- 3 percent (8,600) completed civil service training schemes,
- 1 percent (2,400) completed the course programme of *Berufsakademien* and finally 1,200 persons so-called *Fachakademien* (Durrer and Minks, 1989, p. 15).

It should be added, though, that some qualified secondary school leavers turning to vocational training subsequently enrol at institutions of higher education before they fully complete vocational training and that among those completing vocational training about a quarter subsequently enrol at higher education institutions (Durrer-Guthoff, 1987, p.130).

As already mentioned, *Fachhochschulen* do not provide a range of fields of study as broad as, for example, Dutch *Hoger beroepsonderwijs* does - the institutional type abroad which, according to the view held by the German Federal government (Bundesregierung, 1988, pp. 8-9) as well, is the one most similar to German *Fachhochschulen*. In contrast to the Dutch system, compulsory school teacher training in the Federal Republic of Germany is part of the university system; on the other hand, para-professional training in medical and science fields is provided by *Fachschulen*, higher vocational schools not considered to be part of higher education and usually requiring only 10 years of prior schooling.

1.6 Objectives of the Various Types of Higher Education

As already stated, the Framework Act for Higher Education formulates common tasks for all institutions of higher eduction: "According to their specific functions, the institutions of higher education shall contribute to the fostering and development of the sciences and arts through research, teaching and studies. They shall prepare students for occupations which require the application of scientific findings and scientific methods or creative ability in the artistic fields" (Hochschulrahmengesetz, § 2.1). The educational tasks of higher education institutions are defined as follows: "Teaching and study are to prepare students for a profession in a certain sphere of activity, imparting to them the particular knowledge, skills and methods required in a way appropriate to each course so as to enable them to perform scientific and artistic work and to act responsibly in a free, democratic and social state governed by the rule of

law" (Hochschulrahmengesetz, § 7). At the same time, however, the Framework Act points to the right of the individual Länder to define different tasks of the institutional types and also emphasizes different curricular thrusts of universities and *Fachhochschulen*.

As a rule, course programmes at universities are considered to be research-oriented, whereas course programmes at *Fachhochschulen* are meant to be application oriented. The legislation of the individual states varies regarding the extent to which such differences are emphasized.

It is generally assumed that *Fachhochschulen* serve a terminal pre-career function. Only few advanced courses are provided for those having been granted a *Fachhochschule* degree. *Fachhochschule* graduates are not entitled to become doctoral candidates. Some experts estimated that for some period in the 1970s about 30 percent of *Fachhochschule* students or graduates transferred to university-level institutions. Nowadays, this transfer quota is - according to experts' estimates - about 10 percent (see Mönikes, 1988, p. 16) - less than the proportion of university graduates opting for further study.

In order to be accepted as doctoral candidates, graduates from short teacher training courses (qualifying for teacher positions in compulsory schools) can pass special examinations held by the individual university departments eventually granting the doctoral degree. There are no corresponding legal or administrative provisions for *Fachhochschule* graduates. The West German Rectors' Conference suggests that universities develop themselves flexible ways of recognising prior achievement of highly qualified *Fachhochschule* graduates in order to provide opportunities for them to obtain a doctorate without substantial loss of time, but neither this body nor governmental agencies envisage any regular routes for *Fachhochschule* graduates towards a doctoral degree or any rights for *Fachhochschulen* themselves of granting doctoral degrees (see Mönikes, 1988, p. 14).

In all states of the Federal Republic of Germany, a *Fachhochschule* degree entitles the graduate to university study in any field. In some states, already the successful completion of the intermediate examination leads to the qualification of *allgemeine Hochschulreife* (general "maturity" for study). In other states, students completing the first stage of study at *Fachhochschulen* and passing the intermediate examinations acquire only the *fachgebundene Hochschulreife*, i.e. the entitlement to enrol at universities only in the disciplinary area in which they had enrolled at *Fachhochschule*. The receiving university decides on a case-by-case basis which *Fachhochschule* courses the student has taken it considers equivalent to its courses (see Federal Ministry of Education and Science, 1988b, p. 11). It is generally assumed that only part of former *Fachhochschule* achievements will be considered equivalent to the course requirements at university.

Altogether, institutions of higher education in the Federal Republic of Germany reported in 1986 more than 400 course programmes predominantly for persons having been awarded a degree. They are called *Aufbau-, Zusatz- and Ergänzungsstudium* (further, additional or supplementary studies), whereby no clear boundaries can be established between these types of course programmes (see Schnitzer, 1987). About 50 of those programmes frequently lasting one or two years are provided by *Fachhochschulen*, and several programmes provided by universities serve graduates from *Fachhochschulen* as well. Upon completion, certificates or diplomas are awarded, whereby the definition of such supplementary diplomas at *Fachhochschulen* remains vague regarding their equivalence to university degrees. Of all university students in 1986/87, only 18.145 (1.8%) were registered in such courses (Wissenschaftsrat, 1988, pp. 340-6); the actual number might be slightly larger, because of the 12.8 percent of university students enrolled who have already been awarded a degree (most of them changed field or institution or headed for a doctoral degree), a fifth did not specify the type of course programmes they had taken. There are no statistics published on *Fachhochschule* students already previously awarded a degree, for the number of those taking advanced courses still is considered to be marginal.

1.7 Adminstrative and Legal Arrangements

All institutions of higher education are supervised by the corresponding state education or higher education ministries. The few existing Federal institutions (two military colleges and one *Fachhochschule* for public administration) are approved and supervised by the respective state just as are private institutions. Most of the private institutions are church-related theological colleges or *Fachhochschulen* in the area of social work which are more or less completely state-financed.

Formal differences in the legal status and the degree of governmental supervision between universities and *Fachhochschulen* were to be completely abolished according to the 1985 revision of the Framework Act for Higher Education.

Fachhochschulen are not institutionally associated to universities unlike *IUTs* in France or *Escuelas Universitarias* in Spain; they are rather independent legal entities. Only few of them are located in the vicinity of universities.

2

Course Content and Organisation

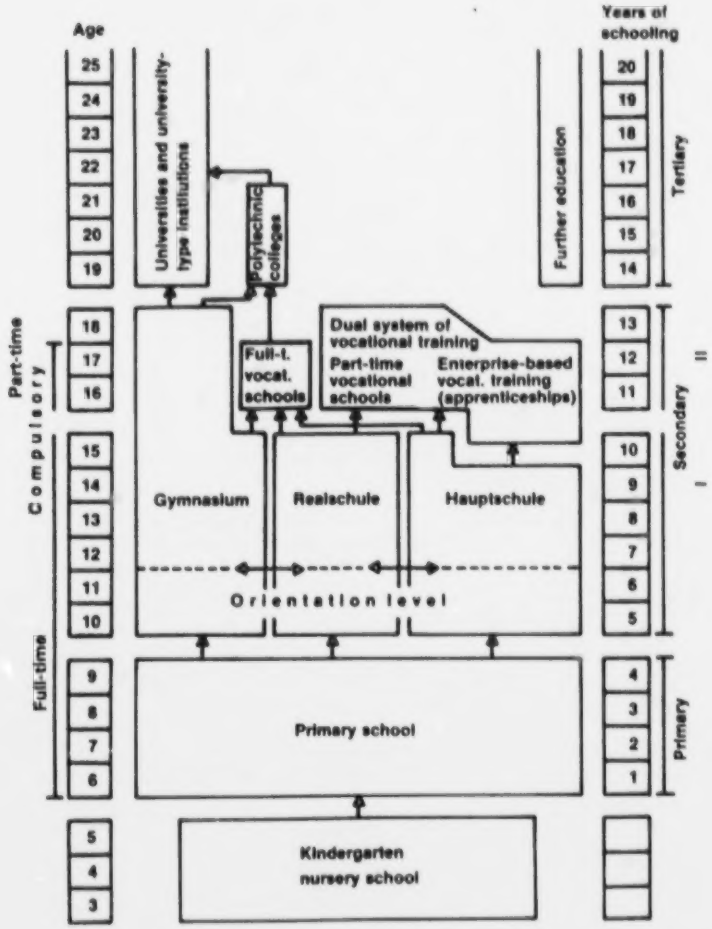
2.1 Entrance Qualifications and Admission

The school system in the Federal Republic of Germany has retained a basically vertical structure (see Chart 1). After four years (after six years in West-Berlin and Bremen) of primary education, pupils have to choose mostly at the age of 10 which of the following schools to attend: (a) the main school (*Hauptschule*) mostly providing 5 grades and in some states 6 grades; most young persons leaving this type of school subsequently attend part-time vocational schools - often combined with apprenticeship training - until the age of 18; (b) the *Realschule*, the intermediate type of secondary schools; after altogether 10 years of schooling young persons usually transfer to higher vocational schools; or (c) the *Gymnasium*, the academic track of secondary education, typically preparing for university education.

In 1960, 74 percent of female and 72 percent of male 13 years olds attended the *Hauptschulen*. 15 percent of boys and 11 percent of girls were at *Gymnasien* and 7 and 8 percent respectively at *Realschulen*. Nowadays, *Hauptschule* has become almost the residual track ("*Rest-Schule*"; see Max Planck Institute for Human Development and Education, 1983, chapter 7), accommodating only 45 percent of boys and 37 percent of girls aged 13 in 1984, whereas 26 and 28 percent respectively were at *Gymnasien*, 5 and 4 percent at comprehensive schools and 23 and 29 percent at *Realschulen* (Bode, 1989).

The vertical structure has been softened in many respects by some reforms as well as by provisions for transfer, for example the establishment of "second routes", the introduction of an "orientation phase" for the 5th and 6th grade during which partly joint courses are provided or at least transfer is eased, and the establishment of comprehensive schools in lower secondary education

Chart 1
The Educational System in the Federal Republic of Germany, 1980



Source: Max Planck Institute of Human Development and Education, 1983, p. 68.

alongside the traditional system in some states (see Max Planck Institute for Human Development and Education, 1983; Teichler, 1985; Mitter, 1987).

Students intending to enrol at universities have to complete 13 years of schooling. As a rule, they attend the *Gymnasium* und complete its final examination, the *Abitur*; only a few percent of students at universities went other routes (see chapter 3). The *Abitur* is considered to qualify for all fields of study.

Various reforms have been realized over the years: (a) first the establishment of different types of *Gymasien* already before World War II (neoclassical, modern language and science); (b) subsequently the recognition of special high schools as preparatory to specific fields of university study; (c) around 1960 the reduction of the number of subjects examined in the final Abitur examination; and (d) finally in 1972 allowing individualized specialization to a certain extent in grade 11-13 (see details in Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder, 1983, pp. 15-26).

Entrance qualifications to higher education are officially classified into three categories:

- the *Allgemeine Hochschulreife* (general qualification) acquired upon completion of the *Abitur* at the *Gymnasium* or at a few other types of equivalent secondary schools;
- the *fachgebundene Hochschulreife* (subject-specific qualification) can be acquired at a number of *Gymnasien* specialized in areas not considered traditional areas of academic secondary education, for example, business;
- the *Fachhochschulreife* (qualification for *Fachhochschulen*). The typical route was newly established in the early seventies: the *Fachoberschule* (higher vocational school) providing 11th and 12th grade education upon completion of the *Realschule*. Young people having completed the *Realschule* and one year of vocational training transfer to the 12th grade at *Fachoberschulen*. Also, students having completed the 12th year of *Gymnasium* might qualify; in some states additional work practice or vocational training is required.

Regulations vary between the German *Länder* regarding additional routes of access: admission for particularly gifted persons without typical school credentials as well as admission to *Fachhochschule* for students from various types of higher vocational schools.

Qualified secondary school leavers are, in principle, entitled to enrol in any field of study at any institution of higher education. The individual institution of higher education might restrict admissions, if the number of students wishing to enrol in a certain field substantially surpasses the capacity. If this

happens in a given field of study at many universities, the admission decision is handed over via joint decision of the Länder to the Central Office of Admissions (*Zentralstelle für die Vergabe von Studienplätzen*). The Office applies three different procedures:

- The distribution procedure, if the number of applicants in a field (at present in business and law for example) is not considerably larger than the available enrolment capacity. In this case each applicant will be admitted in the field desired, though eventually not in the institution of his or her choice.
- The general selection procedure, if the number of applicants is considerably larger than the capacity (at present in architecture, biology and psychology and other fields). Apart from a few percentages reserved for certain groups of applicants (e.g. hardship cases, foreign applications, students already been awarded a degree, etc.), 60 percent of the places are filled on the basis of *Abitur* grades and 40 percent on the basis of the time waited. The waiting period is taken into account in order to assure the right that any person having passed the *Abitur* (even with relatively low grades) has a real chance of enrolling in any field of study (see Secretariat of the Standing Conference of Ministers of Education, 1987, pp. 32-3).
- The special selection procedure for medical fields was revised every few years. Since 1986/87 all applicants have to pass an admission test. Various portions of study places are alloted according to a combination of a few criteria each, whereby in 15 percent of the places the results of personal interviews conducted by the individual universities are the key criteria (Gieseke, 1987, p. 17).

Only in fine arts and music, do the individual institutions administer their own admission procedure and select individually. They either might testify extraordinary artistic talents of applicants not having acquired academic secondary education credentials or might select the most capable ones in their future artistic field among the qualified secondary school leavers.

The general qualification to enrol acquired by *Abiturienten* implies that the selection of intensified courses (*Leistungskurse*) in upper secondary education does not formally predetermine opportunities of enrolment in general or enrolment in specific fields of study. According to a student survey conducted in 1984/85, 10 percent of engineering students at universities and 20 percent of students at *Fachhochschulen* had not chosen mathematics/science/technology as one of the major areas of intensified courses while in upper secondary education. The corresponding quotas were somewhat higher in the case of economic fields: 23 percent of students in economic fields enrolled at universities and 27 percent of enrolled at *Fachhochschulen* had not chosen social sciences

as one of the major areas of intensified courses in secondary education (Bargel et al., 1988, p. 82).

As regards admission to *Fachhochschulen*, state laws as well as practices vary. For example, Bavaria has opted for local admission decision in all cases in which the number of applicants surpass the capacity; Schleswig-Holstein has opted for such a solution in engineering fields. Most states employ the Central Admissions Office and its distribution procedures and selection procedures in the same way as is done nationally in admission to universities. Of all the 521 course programmes at *Fachhochschulen* in the Federal Republic of Germany offered in 1989/90,

- 163 (31.3%) are open for enrolment;
- 229 (44.0%) have local admission procedures;
- 81 (15.5%) are incorporated into the national "distribution procedure"; and
- 48 (9.2%) are incorporated into the national "selection procedure".

In engineering fields, we note on the one hand a relatively high proportion of course programmes open for all qualified secondary school leavers (41%); on the other hand, the "selection procedure" is employed for a relatively large proportion as well (19%; cf. also the list provided by Westdeutsche Rektorenkonferenz, 1989).

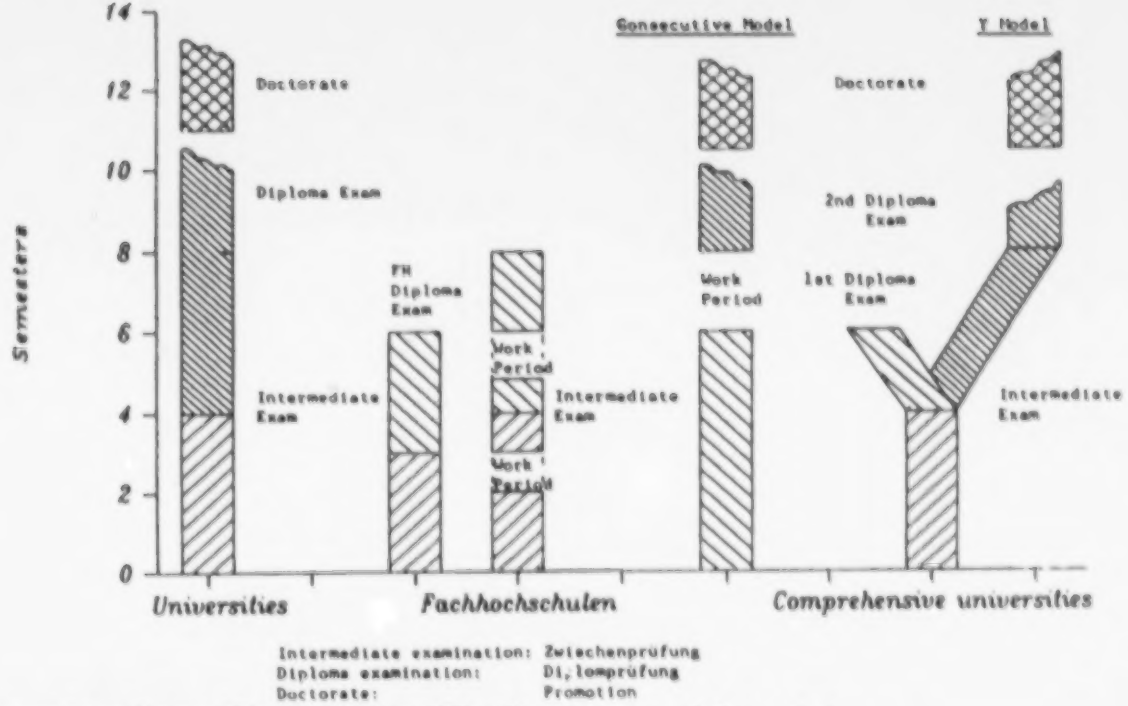
As *Fachhochschulreife* does not comprise a legal right to study similar to the guarantee for persons having passed the *Abitur*, open access for qualified secondary school leavers can be more frequently observed at universities than at *Fachhochschulen*. On the other hand, quotas of applicants for study places at *Fachhochschulen* tend to be lower than those quotas for medical and other highly select fields at universities.

2.2 Duration of Studies

The standard period of study (*Regelstudienzeit*) is regulated on three levels (cf. the overview in Kluge/Neusel, 1984; Mc-Daniel et al., 1988):

- According to the Framework Act of Higher Education, the stipulated length of study in university course programmes is four years, and this should be extended - according to the Framework Act - only in exceptional cases.
- The Standing Conference of the Ministers of Education (KMK) and the West German Rectors' Conference jointly establish general examination regulations for universitiy degrees in general as well as for university diploma degrees of specific fields. Correspondingly, coordinating bodies of Federal and state governments set regulations for course programmes and

Chart 2
Study Routes



Intermediate examination: Zwischenprüfung
Diploma examination: Diplomprüfung
Doctorate: Promotion

Source: Federal Ministry of Education and Science, 1988b, p. 18.

examinations in course programmes which lead to state examinations rather than academic degrees (cf. below, section 2.5).

- The individual departments of institutions of higher education propose study regulations (*Studienordnung*) and examination regulations (*Prüfungsordnung*). The *Prüfungsordnung* of the course programme of the individual department has to be approved by the ministry of education or ministry of higher education of the respective *Land*. It determines the standard period of study for their students.

The officially required periods of study for the different types of institutions and course programmes are shown in Chart 2. They range from three to six years:

- In medicine, 6 years of study are required, including one practical year.
- In most university course programmes, a study period of 8 to 9 semesters is required.
- Teacher training programmes preparing for primary education and non-academic secondary education require 6 or 7 semesters.
- At most *Fachhochschulen*, study regulations set a regular period of three years of study. In Baden-Württemberg and Bayern, 8 semesters are required including 2 practical semesters of workplacement. In Nordrhein-Westfalen, either 7 semesters of study are foreseen or 6 semester of study and additionally one or two semesters of work placement.
- At *Verwaltungsfachhochschulen*, the required period is three years including between one and 1 1/2 years of practical period.
- Short courses at comprehensive universities are similar in structure to those at *Fachhochschulen* and long course programmes at comprehensive universities similar to those at universities. In the case of the consecutive model in Kassel, four years including 2 practical semesters are required in most cases for the first degree, and at least one additional year for the second degree.

The definition of the required period frequently is inaccurate, because the examination period may not have been counted and thus may have to be added.

The actual duration of studies is much longer. One of the major political debates on higher education issues in the Federal Republic of Germany during the 1980s focused on the long actual duration of studies and the high age at the time of completion of study (see Möllemann, 1988; Hochschul-Informations-System, 1988; Hochschulverband, 1988; cf. the international comparison in Teichler/Steube, 1989).

Table 3

Duration of Studies of German Students at Successful Completion of Final Examination according to Type of Institution of Higher Education, Sex and Age

Type of Institution of Higher Education	Feature	Duration of Studies in Years (Average) at Completion of Examination in Study Year					Age (in Years) at Examination Time
		1977	1981	1983	1985	1986	
Universities	a)	6.9	7.2	7.4	7.5	7.6	28.4
	b)	6.1	6.5	6.7	6.9	6.9	
	c)	5.4	5.7	5.8	6.1	6.2	
Comprehensive Universities	a)	4.4	5.5	6.0	6.5	6.5	28.1
	b)	4.1	5.1	5.3	6.2	6.2	
	c)	3.6	4.5	4.6	5.5	5.6	
of which	a)	4.3	4.1	4.7	5.0	4.8	26.9
Short Courses of Study	b)	4.3	4.0	4.6	5.0	4.7	
	c)	3.9	3.6	4.2	4.7	4.5	
Colleges of Education	a)	4.7	5.3	5.6	5.8	5.9	26.9
	b)	4.2	4.7	4.9	4.9	4.9	
	c)	3.6	3.7	4.0	3.9	4.0	
Theological Colleges	a)	6.3	6.4	7.0	6.8	6.8	27.4
	b)	5.7	5.9	6.6	6.4	6.4	
	c)	5.2	5.3	5.8	5.7	5.7	
Colleges of Art and Music	a)	5.9	6.3	6.2	6.4	6.3	26.9
	b)	5.5	6.0	6.0	6.2	6.1	
	c)	4.5	4.7	4.8	5.0	5.0	
Fachhochschulen	a)	3.8	4.2	4.5	4.6	4.6	26.7
	b)	3.7	4.1	4.5	4.5	4.5	
	c)	3.5	3.8	4.1	4.1	4.2	
Colleges of Public	a)	•	•	3.1	3.2	3.2	25.9
Administration	b)	•	•	3.1	3.1	3.1	
	c)	•	•	2.9	3.0	3.0	
Total – Male	a)	6.0	6.4	6.6	6.6	6.6	28.2
	b)	5.4	5.9	6.0	6.1	6.1	
	c)	4.8	5.1	5.3	5.4	5.4	
– Female	a)	5.0	5.8	6.0	6.1	6.1	27.0
	b)	4.6	5.4	5.5	5.7	5.8	
	c)	4.1	4.8	4.9	5.2	5.3	
– Total	a)	5.6	6.2	6.3	6.4	6.4	27.7
	b)	5.1	5.7	5.8	6.0	6.0	
	c)	4.5	5.0	5.1	5.3	5.4	

a) = Duration of studies from first registration at a university or other institution of higher education to completed final examinations
b) = Duration of studies according to semesters in higher education
c) = Duration of studies according to subject – related semesters

Source: Federal Ministry of Education and Science, 1988a, p. 101.

- In 1987, new entrant students at universities were on average 21.3 years old - men 21.6 years and women 21.0 years. New entrant students at *Fachhochschulen* were even 22.4 years old on average - men 22.7 years, women 21.6 years (Bundesminister für Bildung und Wissenschaft, 1988, pp. 162-3; see also Leszczensky and Nigmann, 1988, p. 8). In this context, one should mention that 51 percent of the secondary school leavers qualified to enrol went to military or alternative service during that year (Lewin, 1988a). The higher age of new entrant students at *Fachhochschulen* than at universities reflects the fact that a larger proportion of the former take vocational training prior to their studies (see Durrer-Guthof, 1987).
- Those being awarded a university degree in 1986 spent 7.0 years on average since their first enrolment. The study period in the field in which they finally graduated (*Fachstudiendauer*) lasted 6.2 years; additional 0.2 years were due to official interruptions and 0.6 years to changing the field of study. Those completing short teacher training course programmes took 5.0 years (Wissenschaftsrat, 1988, pp. 352-6). Those completing course programmes at general *Fachhochschulen* spent 4.3 years from first enrolment until graduation, out of which were 0.3 years due to change of field of study and 0.1 years to official interruption. There were substantial differences according to field: Within the respective field, *Fachhochschule* graduates in engineering took 4.3 years on average, those in social work 3.9 years and those in business studies 3.7 years. Finally, graduates from *Verwaltungsfachhochschulen* spent 3.2 years on average from first enrolment until the completion of their studies (Bundesminister für Bildung und Wissenschaft, 1988, pp. 218).
- The average age of those successfully completing university-level course programmes was 27.9 years in 1986. Those graduating from short teacher training course programmes were 25.6 years old, and those from *Fachhochschulen* and other short course programmes were 26.5 years old on average - 27.1 years in social work, 26.6 years in engineering and 26.4 years in business studies (Wissenschaftsrat 1988, pp. 357-9).

The actual average duration of studies and the average age at the time of completion of studies are presented in Table 3. It should be noted that the data in the table refer solely to institutional types, not however to types of course programmes, as presented in the text above.

In the figures on the required and actual duration of periods, two kinds of training phases are not counted:

- First practical training periods required either prior to admission or during the first half of the studies which are mandatory, but in which the learning process is not directly linked to the courses as such;

- second, training phases subsequent to completion of higher education which are officially indispensible for professional qualification, notably in medical, legal and teacher training, subsequent to the first and prior to the second state examination.

Both, practical phases linked to study as well as required training phases not officially linked to study, will be discussed in section 2.4.

It is obvious that some prolongation of study is taken for granted at institutions of higher education. There are, however, substantial differences in the degree to which provisions of course programmes at individual departments require longer periods of study (Helberger et al., 1988) and also in the extent to which students of individual departments actually prolong. For example, the mean duration of study in mechanical engineering up to the completion of a *Fachhochschule* degree (only period within that field) ranged from 3.0 to 4.5 years or even, if we include *Fachhochschulen* requiring practical semesters, to 5.0 years (Wissenschaftsrat, 1989).

It should be noted, though, that statistics on the duration of studies in the Federal Republic of Germany may be somewhat misleading. First, part-time study is not separated from full-time study. According to a student survey conducted in 1984/85, about 10 percent of first-stage university and 3 percent of first-stage Fachhochschule students could be considered part-time students; the corresponding quotas for those in the second stage were 20 and 8 percent, whereby a course load chosen less than half of the average course load was taken as a measure (Bargel et al., 1988, p. 138).

Second, some students continue to be enrolled, even if they actually interrupt studies or if they have graduated and are searching for employment. Authors of a graduate survey conducted in 1984 estimate that more than 20 percent had been "Proforma-Studenten" for some period (Reissert/Walter, 1987, p. 230). Both, the social benefits of being a student as well as the more preferable status of a student than that of a non-employed person, seem to play a role in this context.

2.3 Course Programmes, Teaching and Learning

In the Federal Republic of Germany, studies are generally divided up into semesters. The winter semester (October-February) at universities lasts four months and the summer semester three months (April to July); the actual dates vary somewhat between institutions. At *Fachhochschulen*, both semesters together comprise somewhat more than eight months. Some *Fachhochschulen* have introduced the academic year; also some other *Fachhoch-*

schulen and some university departments offer their courses on an academic year basis.

The main types of courses are (see DAAD, 1982a, pp. 33-4; DAAD, 1982b, pp. 29-32):

- *Vorlesungen* (lectures): the professors lecture on a given subject while the students are expected to listen, to take notes, to read appropriate publications and to recapitulate what was said. Attendance is voluntary, and neither exams are taken nor any certificates (*Scheine*) granted directly linked to lectures.
- *Übungen* (exercise classes): students actively participate in discussing subject matters, writing papers etc. As a rule, achievement is measured (assessment of paper, written examination at the end etc.). At universities, these exercise classes frequently are offered alongside lectures, whereas at *Fachhochschule* hardly any separate lectures are provided; rather, most courses comprise a mixture of lecture and exercises.
- *Seminare* (seminars) are similar to exercise classes, except that more advanced knowledge is treated and that the main emphasis is placed on independent work. In seminars which play mostly a role in the main stage of studies at universities (i.e. the second stage, cf. below), achievement will be monitored on the basis of written papers and in addition possibly on oral contributions.
- Study groups or tutorial classes might be provided additionally at universities, notably in areas treated otherwise in lectures attended by large numbers of students. Junior academic staff and senior students might be in charge of such courses.
- Practical courses (named *Labors* or *Praktika*, the latter not to be confused with practical phases discussed in section 2.4) are common in scientific and engineering subjects. Students learn experimentation, practical skills etc. by using laboratory equipment in a supervised setting. They receive certificates based on reports submitted.
- Courses might be named differently (for example *Praktika* in some cases are similar to *Übungen* in other cases). In addition, other types of courses might be provided, field courses (*Exkursionen*) for example, notably in geograpy. architechture, agriculture etc.

In various humanities and social science fields, at most 20 course hours per week (45 minutes each) are recommended; in science and engineering the number of weekly hours recommended or required might be higher. *Fachhochschulen* tend to require or recommend more hours than do universities.

It should be noted, though, that German course programmes are neither structured according to any clear "currency" such as study hours or credits nor

controlled by annual examinations or other ways of assessment. Rather, the major thrust of teaching/learning and assessment could be characterised as final-examination-oriented. Traditionally, students might have studied for several years without any formal assessment until they got the impression or were told by the professors that they had academically matured to a level which allow them to write a thesis requiring several months of work and to sit for final examinations.

This final-examination-oriented assessment practice has been supplemented and thus relativized by two major elements:

- *Scheine* (certificates): Examination regulations of course programmes inform the students about the content and the number of areas in which students have to demonstrate their achievement. Students receive a certificate after each of those assessments linked to courses and based on papers, examinations etc.
- Stages: Course programmes are subdivided in most cases into stages, the basic studies (*Grundstudium*) lasting four semesters at universities and two to four semesters at *Fachhochschulen*, and the main studies (*Hauptstudium*). In university course programmes leading to a diploma, intermediate examinations (*Vor-Diplom*) have been mandatory for a long time; efforts were made recently to introduce intermediate examinations into all higher education course programmes.

It is generally said that a "school"-type teaching and learning prevails at *Fachhochschulen*: Most courses are mandatory, attendance at courses is frequently monitored, most courses are provided as a mixture of lecture and exercise, achievement at almost all courses is measured, achievement proven over the years plays a significant role in final assessment and grading. On the other hand, freedom of learning is emphasized at universities: achievement is monitored only in parts of the courses, students are expected to do independent work to a significant extent, a substantial proportion of courses is elective, and the thesis and the final (written and oral) examinations play an important role in final assessment. This difference of teaching, learning and assessment styles between the institutional types is considered to be less pronounced in science and engineering fields which are "structured" to a considerable extent at universities as well (cf. Table 4).

The different styles emphasized by the universities and *Fachhochschulen* are strongly reflected in students' attitudes and behaviour. A few examples might be mentioned:

- According to a survey conducted in 1984/85, students at universities take on average 17 weekly course hours (45 minutes each), whereas *Fachhochschule*

Table 4
Teaching Style and Attitudes of Academic Staff to Students according to Students' Perception, by Type of Higher Education Institution and Field of Study (percentage*)

Teaching style and attitudes of academic staff	Mechanical engineering				Social work				Economic fields				Tot
	FH	GH	Uni	Tot	FH	GH	Uni	Tot	FH	GH	Uni	Tot	
Stimulate interest in the field	19	8	24	20	41	39	39	40	16	20	19	18	26
Try to coach facts	72	65	60	64	25	24	16	23	74	61	64	65	51
Transmit knowledge well	28	33	39	35	52	53	56	53	41	27	31	33	40
Are academically demanding	54	48	80	68	51	52	68	54	53	67	76	70	64
Set high achievement standards	80	73	73	75	14	16	16	15	59	64	71	68	52
Are only interested in research	5	18	35	24	9	12	17	11	8	27	35	29	22
Keep some distance	56	45	55	54	17	23	21	20	47	47	56	53	43
Take time for advice	43	43	30	36	79	66	51	69	48	42	36	39	48
Accept academic criticism	40	29	53	45	78	75	75	76	44	58	55	53	59
Are responsive to students' questions	67	69	62	65	88	84	92	87	62	71	63	64	72
Accept discussions outside their area of expertise	17	15	13	15	70	67	82	71	35	21	17	21	36
Like to demonstrate their academic superiority	36	29	29	31	11	10	14	11	37	29	31	32	25
Avoid informing students about errors	25	35	26	27	23	18	21	20	26	18	28	27	25
(n)	85	49	158	292	182	147	67	396	111	66	358	535	1223

* Question: Which of the following statements apply to the professors in your field of study? Scale 1 (all), 2 (most), 3 (few), 4 (none).

Source: Teichler et al., 1987, p. 108.

students take 25 course hours a week. The corresponding figures are 17 and 27 hours for engineering students and 17 and 24 hours for students in economic fields (see Table 5).

Table 5
Time Spent on Lectures, Study in General and Work by Students, by Type of Higher Education Institution, Stage of Course Programme and Field of Study

	Weekly hours during lecture period spent on...			Studies leave not enough time for anything else	
Types of institution and field	Lectures (hours)	Studies altogether (hours)	Studies and jobs (hours)	Yes (%)	No (%)
Universities	17	36	43	34	27
Humanities	14	33	40	48	14
Social science	13	30	38	49	13
Law	14	35	40	48	13
Economic fields	17	36	43	34	22
Medical fields	22	42	47	18	48
Natural sciences	19	39	45	23	38
Engineering	17	38	44	25	35
Fachhochschulen	25	43	48	23	38
Social work	20	31	37	50	12
Economic fields	24	39	45	29	23
Engineering	27	46	50	16	47

Source: Bargel et al., 1988, p. 136

-According to a survey conducted 1983/84 on students in their final examination period, 10 percent of mechanical engineering students at universities had made use of their right to change the institution during their course of study, but only 1 percent of the *Fachhochschule* students. The corresponding figures for students in economic fields were 15 and 5 percent (see Table 6).

- According to the same survey, 26 percent of engineering students at universities reported that they tried to shape the programme themselves rather than to follow closely the study and examination regulations; the corresponding quota at *Fachhochschulen* was 17 percent; in economic fields the respective proportions were 19 and 13 percent.
- According to the same survey, 31 percent of engineering students at *Fachhochschulen* had not taken optional courses in other disciplines; the respective quota was 18 percent for university students; in economic fields a similar difference - 21 and 12 percent respectively - is apparent.
- In assessing their studies, a higher proportion of university graduates than *Fachhochschule* graduates believes that they were instrumental in advancing intellectual abilities (53 as compared with 40 %) as well as general work methods (44 and 32 %); university graduates also note slightly more frequently a contribution of their studies to knowledge in their field, independent work, and personality development in general. On the other hand, *Fachhochschule* graduates state more frequently than university graduates that their studies had contributed to practical proficiencies (21 as compared to 11 percent; see Table 7).

Table 6
Study of a Second Course Programme, Change of Field of Study, Change of Institution of Higher Education, Interruption of Study, and Study Abroad, by Type of Higher Education Institution and Field of Study (percentage)

	Mechanical engineering				Social work				Economic fields				Total
	FH	GH	Uni	Total	FH	GH	Uni	Total	FH	GH	Uni	Total	
Second course programme	2	4	12	8	4	8	21	9	7	-	7	6	8
Change of field of study	4	2	14	9	4	13	18	10	6	14	15	13	11
Change of institution of higher education	1	4	10	6	7	16	18	12	5	14	15	12	11
Interruption of studies	11	20	14	14	9	8	10	9	7	14	12	11	11
Study abroad	5	2	2	3	2	2	1	2	6	3	4	4	3
No change of field and/or institution	83	76	62	80	65	47	69	77	70	70	61	66	67
Total	105	108	114	110	105	111	114	109*	108	114	114	113	111

Source: Teichler et al., 1987, p. 140.

Table 7
Self-Rating of Attainments by University and Fachhochschule Graduates
(percentage)

My studies contributed strongly to	Fachhochschulen	Universities
Academic knowledge	64	73
Personality development	51	57
Independence	43	50
Intellectual abilities	40	53
Critical thinking	38	42
Working methods	32	44
Practical skills	21	11
Social competencies	21	19
Social responsibility	21	19
General educational cultivation	18	18

Source: Lezcensky/Nigmann, 1988, p. 17.

2.4 Practical Periods

Most handbooks on higher education institutions or on higher education studies give little information about practical periods associated to studies in higher education (cf. UNESCO, 1982; Mohr and Liebig, 1988). It might be justified, though, to state that we note more practical periods associated to studies in German higher education than in any other Western European higher education system (see Jablonska-Skinder/Teichler, 1989). Three characteristics might be named in this respect. First, a substantial number of course programmes in the Federal Republic of Germany require practical experience prior to enrolment or alongside study in higher education. Second, study and subsequent training for public-sector professions are closely linked. Third, initial training periods for private-sector professions are less formalized in the Federal Republic of Germany than for example in the United Kingdom, France, and the U.S., where professions play a strong role in controlling professional training.

In many course programmes at German institutions of higher education, students are required to spend some period of work experience. In some fields, for example teacher training for teaching in compulsory schools and in medical fields, such practical periods are mandatory. In some fields of study, such as engineering and business administration, regulations may vary from one institution to the other. In general, all students at *Fachhochschulen* spend at least 6 months of work experience as a prerequesite prior to studies or during their study period. Arrangements differ substantially. Some typical examples are the following (cf. also Kluge et al., 1981):

(a) In some fields of study at some institutions, students are required to spend a certain number of weeks or months (up to 9 months) of work experience, a so-called *Praktikum*, in a firm, public agency etc. and on a work assignment somewhat related to their field of study. Some course programmes require all or part of the *Praktikum* to be completed prior to enrolment. *Praktika* (prior to enrolment and/or alongside the first years of study) are a prerequisite for all *Fachhochschule* course programmes not incorporating practical semesters, all engineering programmes at universities, most vocational teacher training programmes, etc. According to a survey on secondary school leavers in 1986, five percent were not enrolled at the end of the year because they were just in the process of doing such a practical phase (Lewin, 1988a, p. 11), but altogether probably more than a third of the students have to *do Praktika* prior to their studies or in the early stages of studies (unless they had not taken vocational training).

(b) In some course programmes, brief *Praktika* are required at certain stages. In most of these cases, the institutions of higher education are involved in the preparation, supervision and subsequent analysis of the experience acquired.

(c) All *Fachhochschulen* in Bayern and Baden-Württemberg, some course programmes at *Fachhochschulen* in Nordrhein-Westfalen and all integrated course programmes at the Comprehensive University of Kassel require students to spend mostly two semesters at a work placement corresponding to their field. Such *Praxis-Semester* or *Berufspraktische Studien* might be split into an early phase of getting acquainted with the world of work and a late phase close to future professional assignment. Close links are emphasized between study and work experience. In most cases, the institutions of higher education actively take part in finding suitable work placements and in providing courses for the curricular integration of the practical experience.

(d) Some curricular experiments began in the 1970s intended to substitute the traditional two-stage sequence of studies ending with a first state examination and subsequently a training phase leading to a second examination by a so-called one-stage training (*einstufige Ausbildung*). In the latter, a sandwich

structure of studies and practical phases accompanied by courses aimed to link theoretical knowledge and work experience were introduced at some institutions of higher education. These new models eventually were discontinued in law and teacher training during the 1980s, but were preserved at some departments of social work at *Fachhochschulen*.

(e) Finally, some specialised institutions - the two military colleges and the *Verwaltungsfachhochschulen* - provide study opportunites only for persons in the army or persons at least provisionally employed in the public sector.

Fachhochschulen point to those practical periods as an essential component of the practice-oriented or applied approach of their course programmes in general. In the case of the *Verwaltungsfachhochschulen*, the practical period comprises a third or even half of the total official study period.

2.5 Certification

Students who successfully complete the first stage of their studies receive a document. It is called *Vor-Diplom* (pre-diploma) in the case of *Diplom* course programmes at universities. Such a document serves solely internal procedures of the higher education system; it is not considered to indicate a certain visible qualification to the employment system. Framework regulations regarding *Diplom* course programmes at universities emphasize a common core of the first stage which is intended to ease students' decisions to move to another university without any complications and loss of time immediately after completion of the *Vor-Diplom*.

Suggestions had been made frequently to introduce certificates to be handed out to students who do not complete the whole course programme. As a rule, however, drop-outs cannot expect any visible recognition of their higher education studies on the labour market.

Three types of final examinations and degrees are offered at the completion of course programmes at universities in the Federal Republic of Germany, the *Diplom*, *Magister* and *Staatsexamen* (cf. the overview in Jablonska-Skinder/ Teichler, 1989). The *Diplom* is an academic degree predominantly in science, engineering, social science and economic subjects. It is considered to imply both full academic and professional qualification which entitles the holder to independent work in corresponding professional fields. Course programmes leading to a *Diplom* degree follow a general framework set nationally. The final *Diplom examination* consists of a thesis which has to be completed within a period of mostly six to nine months and a fixed set of comprehensive subject examinations, both written and oral, most of which take part at the very end of

the studies. The examinations are administered by the academic staff of the degree-granting university.

The *Magister Artium* (M.A.) is an academic degree almost exclusively awarded in the humanities and social sciences by universities or other institutions providing university-type course programmes. It is considered to be a purely academic degree not qualifying for certain professions; there are obviously cases, though, in which the distinction between *Diplom* and *Magister* is blurred both regarding the disciplinary areas in which they are awarded and the professional emphasis. The course programmes as well as the final examinations must comprise either two major subjects or one major and two minor subjects. The individual departments and universities have more leeway in setting specific study and examination regulations than in the case of course programmes leading to a *Diplom*. Examinations are similar to those for a *Diplom* award; they also are administered by the academic staff of the awarding university.

The *Staatsexamen* is administered predominantly in medical fields, law and teacher training. It is awarded by the state, not by the universitiy at which the course programme was completed. It is considered equivalent to the *Diplom* or the *Magister*; however, it does not lead to any title such as the *Diplom-Physiker* or the *M.A.* The *Staatsexamen* ist administered jointly by academic staff and officials of public examiniation offices in compliance with state laws and regulations. The influence of state laws and regulations is restricted to the formal organization of studies, whereas the responsibility for the academic quality and content rests within the university. In most cases in which a state examination takes place at the completion of university studies, second state examinations will be administered after an initial professional training phase; at this point, a title might be awarded.

Apart from these nation-wide used awards, art colleges might confer their individual certificates bearing various names. Further, some university-level course programmes in law and theology are concluded by a *Lizentiatsprüfung*; the abbreviated title is *Lic.* Finally, the title *Baccalaureus* is awarded in a few exceptional cases at universities.

Among degrees conferred on completion of university course programmes (excluding doctoral degrees) in 1985, 41 percent were *Diplom*, 4 percent *Magister*, 28 percent examina for teacher training, 24 percent other state examinations, and 3 percent other awards (art degrees and certificates, church degrees, etc.; see Möncke, 1987).

Fachhochschulen award a *Diplom* only. In the case of social work course programmes comprising a one-year practical period, a state award is acquired concurrently. The *Diplom* examination at *Fachhochschulen* is administered principally in the same way as the university *Diplom* examination; however, the

thesis mostly has to be completed within a period of three to six months. The Standing Conference of the Ministers of Education has agreed on a fixed list of *Diplome* to be awarded by *Fachhochschulen*. The naming and title of the *Diplom* awarded comprises a supplement (*FH*), for example *Diplom-Ingenieur (FH)*, thus referring explicitly to the *Fachhochschule*. In the 1970s, graduates from *Fachhochschulen* were not awarded a *Diplom*, but rather a *Graduierung*; the title conferred was, for example *Ing. (grad.)*. When the *Diplom* was introduced in the early 1980s, the titles conferred in some states, such as *Diplom-Kaufmann*, did not refer explicitely to *Fachhochschulen* in contrast to unversities. The revision of the Framework Act 1985 called again for a visible reference of the *Diplom* degree and title to the *Fachhochschule* by means of the (*FH*).

2.6 Mechanisms of Curricular Innovation

Curricular innovation at institutions of higher education in the Federal Republic of Germany could take three different routes, according to its initiation: the department (*Fakultät* or *Fachbereich*), the state (*Land*) or nation-wide bodies (see overviews in Kluge/Neusel, 1984; Mc-Daniel 1988).

The department aiming to revise curricula might propose a new *Studienordnung* (study regulations) and *Prüfungsordnung* (examination regulations). The Senate will discuss the proposal and might officially comment on it but has no formal power of approval or rejection. The ministry of education (of higher education etc.) in charge of the respective *Land* has the power to approve the *Prüfungsordnung*. For example, it might reject the proposed examination regulations of the course programme leading to a *Diplom*, because it considers them not to be compatible with the diploma framework regulations of the respective field of study. As regards the study regulations, the state government is only in charge of examining their formal and legal soundness; before the revised 1985 Framework Act for Higher Education was implemented in corresponding state higher education legislation, the state ministries were also in charge of general approval of study regulations.

The state ministry supervising higher education institutions could take the initiative regarding curricular reform. It might invite representatives of respective fields to informal meetings, it might establish itself study reform commissions on state level and subsequently establish framework regulation for curricula of the respective fields of study.

Nation-wide framework regulations for course programmes might be established. The Standing Conference of the Ministers of Education of the States (*KMK*) and the West German Rector's Conference (*WRK*) jointly form a

General Commission for the Co-ordination of Studies and Examinations. This, among others, will decide in which fields *Fachkommissionen* should be established. The commissions are jointly established by *KMK* and *WRK*, whereby the *WRK* consults the respective *Fakultätentag*, i.e. the assembly of deans. In those commissions, four professors, one junior academic staff member and one student each, two state government representatives and - in advisory capacity only - one representative each of the Federal government, the employers and the unions or professions will draft a curricular framework. In the process, they might establish sub-commissions for universities and Fachhochschulen; the regulations eventually recommended are specific for universities and *Fachhochschulen*. Finally, the Standing Conference will decide together with the *WRK*.

From 1978 until the implementation of the 1985 revisions of the Framework Act for Higher Education in the late 1980s, two different kinds of mechanisms of nation-wide curricular innovation and co-ordination had existed: Study Reform Commissions on the one hand in charge of innovation and on the other hand *KMK-WRK* commissions in charge of framework regulations for university diploma course programmes. These are intended to be merged in the new setting, whereby the role of the institutions of higher education in curricula innovation vis-à-vis the government is to be strengthened. It is premature now to assess the impact of those revisions on the readiness of curricular innovation in general and on the respective role of institutions of higher education and of the state as regards curricular innovation.

The formal role of the employment system in curricular innovation is weak, as far as the private sector of the economy is concerned. Before the establishment of Study Reform Commissions in 1978 they were not formally involved in the decision making process, although they might have played a strong role informally in fields such as engineering, chemistry etc. As regards the public sector, governmental role is very strong. Decisions on relatively tight framework regulations for medical education, law, teacher training, public administration, social work etc. are taken in the framework of specific formal procedures, in which the ministries supervising the respective occupational practice dominate.

3

The Prestige of Institutional Types

3.1 Selection and Allocation of Students

Any statistical information on numbers of pupils, students and graduates as well as selection and transfer processes has to be read with some caution. Data presented vary in many respects: whether predecessor institutions are included in time series data or not; whether total numbers of students are presented or only those of German citizens; reference to age cohorts might have changed in calculations of quotas of new entrant students, graduates etc.; data on *Fachhochschule* students, graduates etc. might include or exclude students in short courses at comprehensive universities or students at Verwaltungsfachhochschulen; definitions of unemployment quotas changed over time, etc. In the following text, we will therefore briefly refer to definitions on many occasions.

Table 8 provides an overview on absolute figures and respective quotas of qualified secondary school leavers, new entrant students and graduates. These data include foreigners (as will be discussed later, the percentage of foreign students at institutions of higher education in the Federal Republic of Germany remained more or less constant around 6 %).

The proportion of young people completing those types of secondary education possibly leading to higher education has substantially increased during the last few decades and is expected to increase further, though to a lesser extent. In 1973, when *Fachoberschulen* - the new type of school leading to *Fachhochschulen* - were fully established, 19.2 percent of young Germans completed higher education-preparatory secondary education. This proportion reached 24.0 percent in 1980 and increased to 29.7 percent in 1982; in 1986, it

Table 8
Access to Higher Education and Graduation in the Federal Republic of Germany 1960-1986

		1960	1965	1970	1975	1980	1986
Secondary school leavers (in 1,000s)	Academic track	55.4	51.7	89.2	125.5	168.0	224.2
	Higher vocational track	-	-	-	46.7	50.6	66.6
	Total	55.4	51.7	89.2	172.7	218.6	290.8
Secondary school leavers in percent of corresponding age group[1]	Academic track	5.6	7.2	10.9	14.7	17.2	21.2
	Higher vocational track	-	-	-	5.5	5.2	6.2
	Total	5.6	7.2	10.9	20.2	22.4	27.4
Beginner students (in 1,000s)	At universities[2]	65.4	63.2	92.2	120.7	138.2	147.3
	At Fachhochschulen	20.6	26.5	29.2	42.8	51.7	64.4
	Total	86.0	89.7	121.4	163.5	189.9	211.7
Beginner students in percent of corresponding age group[1]	At universities	6.6	8.8	11.2	14.2	14.2	13.9
	At Fachhochschulen	2.1	3.7	3.6	5.0	5.3	6.2
	Total	8.7	12.5	14.8	19.2	19.5	20.1
Graduates[3] (in 1,000s)	From universities	27.9	40.5	4.3	70.7	70.9	80.5
	From Fachhochschulen	11.3	15.3	22.0	30.6	33.3	48.5
	Total	39.2	55.8	69.3	101.3	104.2	129.0
Graduates in percent of corresponding age group[4]	From universities	3.4	4.3	7.2	9.6	8.9	8.5
	From Fachhochschulen	1.4	1.6	3.3	4.1	4.2	5.1
	Total	4.8	5.9	10.5	13.7	13.1	13.6

1 18-21 years old
2 universities, comprehensive institutions, art academies etc.
3 total number of exams excluding those doctoral exams not preceded by previous exams
4 23-27 years old

Source: Wissenschaftsrat: Zur Lage der Hochschulen Anfang der 80er Jahre. Textteil. Köln 1983, p. 11. 19. 22 and 85; Wissenschaftsrat: Empfehlungen des Wissenschaftsrates zu den Perspektiven der Hochschulen in den 90er Jahren. Köln 1988, pp. 279.

was 29.8 percent (Wissenschaftsrat, 1988, p. 279). In 1984, when data were available for 1982, the Standing Conference of the Ministers of Education forecasted a further increase by five percent of the age cohort until 1992 (see Schomburg/Steube, 1986, p. 258).

Among persons completing higher education-preparatory secondary education, the proportion of those acquiring *Fachhochschulreife* was 26.0 percent in 1973 and 22.9 percent in 1986 (Wissenschaftsrat, 1988, p. 279). The proportion slightly went up and down slightly over the years. Obviously, this route of access to higher education did not increase in popularity.

Annual surveys are conducted regarding final-year secondary students' intention of transferring to higher education. The proportion of those intending to study (not necessarily in the same year) declined among last-year students in *Gymnasien* from 74.5 percent in 1976 to 58.2 percent in 1985, but subsequently increased again slightly to 63.4 percent in 1988; those who had not yet decided, comprised 15.4 percent in 1976 and 23.2 percent 1988 and those not intending to study 10.2 and 13.4 percent respectively. Among last-year students at *Fachoberschulen*, the correspoding data showed a similar trend on a slightly higher level: the figures were 77.9 percent in 1976, 60.8 percent in 1985 and 66.5 percent in 1988; those who had not yet decided comprised 15.6 and 23.8 percent and those not intending to enrol 6.5 and 9.7 percent (ibid., p. 283).

The proportion of young Germans actually beginning studies at institutions of higher education - according to figures recently published by the Federal Ministry of Education and Science (1988a, p. 68) - remained almost constant from the mid-seventies to the mid-eighties: 19.6 percent in 1975, 19.5 percent in 1980 and 19.7 percent in 1985; it increased recently to 23.0 percent in 1987. The number of new entrant students in 1987 corresponded to about 80 percent of young people of the same year completing higher education-preparatory secondary education (ibid., p. 72). As already mentioned, however, most young people completing secondary education do not transfer to higher education in the same year.

It is frequently claimed in the Federal Republic of Germany that study at *Fachhochschulen* has become increasingly popular. The data presented by the Science Council in 1988, however, do not strongly support this view. The Science Council excludes in its calculation the *Verwaltungsfachhochschulen* which had been established around 1980 and are open only for persons already employed in the public sector. Accordingly, the quota of new entrant students at *Fachhochschulen* was 27.6 percent in 1971, 26.2 percent in 1975, 24.6 percent in 1980, 27.8 percent in 1985 and 28.3 percent in 1987. If we include *Verwaltungsfachhochschulen*, the proportion of new entrant students at both types of *Fachhochschulen* increased from 28.1 percent in 1980 to 32.2 percent in 1985 and to 33.2 percent in 1987. Thus the increase in the proportion of

those enrolling at *Fachhochschulen* during the 1980s seems to be relatively small in essence, because in part it makes up for losses during the 1970s, and in part it is due to the addition of public administration course programmes to this sector.

The relative popularity of each of the two major types of higher education can best be tested by analysing the changes of the quotas of new entrant students among those newly enrolling in economic fields (notably business studies, political economy and industrial engineering) and engineering fields, because these are the only two major disciplines in which we note both full-fledged study provisions and regular careers for both types of of higher education institutions:

- Among German new entrant students in economic fields, the proportion enrolled at *Fachhochschulen* increased from 28.9 percent in 1976/77 to 30.3 percent in 1980/81 and to 31.5 percent in 1986/87.
- Among German new entrant students in engineering fields, the proportion enrolled at *Fachhochschulen* rose from 58.9 percent in 1976/77 to 59.7 percent in 1980/81 and to 60.4 percent in 1986/87 (own calculation based on Wissenschaftsrat, 1988, pp. 287-292).

It cannot be clearly established whether this moderate shift towards *Fachhochschulen* reflects the students' intentions or was influenced by available study opportunities. As regards engineering, admission restrictions at universities were fairly moderate; the former view certainly would be appropriate. In business studies, the ratio of applicants to study places at universities was 1.8:1 in 1977/88, 1.3:1 in 1980/81, and 2.8:1 in 1986/87 (ibid., pp. 297-9). Corresponding data regarding *Fachhochschulen* are not available. We cannot exclude the possibility that restrictions in access to business studies at universities have contributed to a growing proportion of young people turning to *Fachhochschulen*.

Among all German first-semester students at universities in 1987, 82.0 percent had completed the *Abitur* at a regular *Gymnasium* and further 11.2 percent the *Abitur* at other types of academic secondary schools. 2.9 percent had completed *Fachoberschulen* and 0.4 percent various types of higher vocational schools (Federal Ministry of Education and Science, 1988a, pp. 82-3); we may estimate that more than half of these 3.3 percent of students of the latter two categories are enrolled in integrated course programmes at comprehensive universities which admit students having acquired a "maturity" to study at Fachhochschulen.

At *Fachhochschulen* the percent of first-semester students having previously acquired the right to study at universities increased over the years (see Bundesminister für Bildung und Wissenschaft 1981, pp. 140-1; Federal Ministry of

Education and Science 1998a, pp. 82-3). It was about 16 percent in 1975 and increased rapidly to 29 percent in 1977 and 42 percent in 1979. It also was 42 percent in 1983 and increased to 49 percent in 1985 and finally to 52 percent in 1987.

These figures to reveal another interesting fact: The first-year students in 1986 who were entitled to enrol in university courses corresponded to 67 percent of the secondary school leavers of the same year entitled to proceed to universities. The number of first-year students in 1986 whose secondary schooling qualified them for *Fachhochschule*, however, corresponded merely to 45 percent of the secondary school leavers of that qualification. The corresponding quotas had been 85 percent and 64 percent in 1975 (own calculations based on Wissenschaftsrat, 1988, pp. 279 and 295). Whereas - as already shown above - a slighty higher proportion of students in their final year at *Fachoberschule* state their intention to proceed to higher education than students in their final year at *Gymnasium*, actually a much lower proportion of *Fachoberschule* leavers enrol in higher education.

The longitudinal surveys conducted by the *Hochschul-Informations-System* in principle confirm these findings, though to a lesser extent. Of those having acquired *Abitur* in 1980, 79 percent had begun studying within the first 4 1/2 years, and 68 percent of those having completed *Fachoberschule*. Surprisingly, a slightly higher percentage of *Abiturienten* began vocational training (30 % as compared to 21 % of *Fachoberschule* leavers). This might be explained by the fact that *Fachoberschulen* are also considered to be some kind of vocational preparation; this is confirmed by the fact that 10 % of *Fachoberschule* leavers (as compared to 2 % of *Abiturienten*) neither studied nor went to vocational training within 4 1/2 years after graduation - most of them began gainful work (Durrer-Guthoff, 1987, p. 131; it should be noted, though, that among the 1976 school leavers, the proportions of those two types of school leavers eventually studying were not different according to the HIS surveys).

Obviously, parental educational background plays a role in the decision upon completion of secondary education. Among qualified secondary school leavers in 1980 whose fathers had completed higher education, 88 percent enrolled within 4 1/2 years as compared to 72 percent of those whose fathers did not complete higher education. On the other hand, vocational training as well as neither study nor vocational training were more frequent options of those not from academic background (30 % as compared to 21 % and 4 % as compared to 1 % of those whose fathers were college-trained; ibid.).

According to surveys commissioned by *Deutsches Studentenwerk* (the agency in charge of student housing, student dining halls and administration of fellowships), the proportion of university students whose fathers were blue-

Table 9
Social Background of Students at Universities and Fachhochschulen 1952-1985 (in percent)

Social background	1952	1962	1967	1973	1976	1979	1982	1985
a) Students at universities								
Civil servant	38	33	30	27	25	24	24	25
Salaried employee	23	30	31	33	35	36	37	39
Self-employed	35	28	30	26	24	22	21	20
Manual worker	4	6	7	11	13	14	16	16
Others	0	3	2	3	3	4	2	-
Total	100	100	100	100	100	100	100	100
b) Students at Fachhochschulen								
Civil servant	.	.	.	15	14	14	15	15
Salaried employee	.	.	.	31	31	32	36	38
Self-employed	.	.	.	23	21	19	20	20
Manual worker	.	.	.	27	28	27	28	27
Others	.	.	.	4	6	8	1	-
Total	.	.	.	100	100	100	100	100

Source: Regular surveys on "Das soziale Bild der Studentenschaft".

collar workers comprised only 4 percent in 1952 and 6 percent in 1962. It rose to 11 percent in 1973, when the corresponding proportion was 27 percent among students at *Fachhochschulen*. Until the early eighties, this gap had somewhat narrowed, as Table 9 shows. Whereas the proportion of Fachhochschule students from blue-collar parental background has remained more or less constant (28 % in 1982 and 26 % 1985), its share among university students had risen (to 16 % in 1982 and 15 % in 1985).

Official statistics on the occupational status of the fathers first-semester students can only be viewed as time sequence, if we exclude the recently increasing percentage of students not providing any information at all. Accordingly, we estimate that the proportion of first-semester university

students whose fathers were blue-collar workers was 15 percent each in 1975 and 1980, but declined to 12 percent in 1987. The corresponding proportion of first-semester Fachhochschule students was 28 percent in 1975, 26 percent in 1980 and declined to 22 percent in 1987 (cf. Ministry of Education and Science, 1988a, p. 86). This decline can be be attributed only in part to the changing occupational structure as such, for the proportion of *Arbeiter* among the employed male labour force was 49 percent in 1975, 48 percent in 1980 and declined only to 45 percent in 1987 (own calculation based on Bundesminister für Bildung und Wissenschaft, 1988, pp. 282-4).

The larger proportion of students from blue-collar-background among *Fachhochschule* students is also reflected in students' sources of income. Among first-semester students surveyed in 1986/87, only 42 percent of those enrolled at *Fachhochschule* named parents as their major source as compared to 70 of those enrolled at universities. On the other hand, 39 percent of the *Fachhochschule* students and 18 percent of the university students had student aid as their major source of support. 9 percent of first-year students at *Fachhochschulen* and 6 percent of those at universities earned most of the money they needed by themselves (Lewin, 1988a, p. 19).

Among those young people successfully passing the *Abitur* in 1973, 42.1 percent were women. This quota increased to 47.5 percent in 1980 and to 49.2 percent in 1987. The respective proportion among those successfully completing the *Fachoberschule* increased substantially from 21.5 percent in 1973 via 38.5 percent in 1980 to 41.4 percent in 1987 (Wissenschaftsrat, 1988, p. 279). It should be noted that most *Fachoberschulen* were specialized in technical and economic fields at the beginning; those preparing for social work were added subsequently.

Already during their final year at school substantially more female than male pupils state that they do not intend to study at institutions of higher education. Among pupils in the final year at academic secondary schools in 1980, 16 percent of females and 7 percent males did not intend to study; this gap widened to 19 and 8 percent in 1988. Of last-year pupils at *Fachoberschulen*, 13 percent of females and 5 percent of males stated in 1980 that they did not intend to study; this gap widened substantially to 20 and 5 percent respectively in 1988 (ibid, 1988, p. 283).

Among German new entrant students at universities (including art colleges), 41 percent were female in 1975, 44 percent in 1980 and 43 percent in 1987. Among new entrant students at *Fachhochschulen*, the corresponding quotas were 25, 32 and 33 percent (Ministry of Education and Science, 1988a, pp. 68 and 70). These data show that the increase of the share of qualified female secondary school leavers during the 1980s did not translate into a corresponding growth of the share of females among new entrant students.

The type of "maturity" is more important for women than for men in determining whether they will transfer to higher education:

- Of the male *Abiturienten* in 1983, 80 percent had begun studies within 4 1/2 years; the corresponding quota was 76 for *Fachoberschule* leavers.
- Of the female leavers from academic secondary schools, 62 percent eventually enrolled at instititutions of higher education during the subsequent 4 1/2 years, but only 43 percent of those completing vocational high schools (Durrer/Minks, 1989, p. 16).

In explaining changes during the 1980s as regards selection at entry to higher education according to socio-economic background, sex and type of qualification, we have to refer to two facts (cf. Baethge et al., 1986): First, the growing unemployment quota in general and the increased employment problems for graduates from many fields of study; second, a substitution of the predominant grant scheme of public student aid by a loan scheme in 1983 as well as a general decline of the proportion of public student aid among the total living costs of students (cf. the overview in Schomburg/Steube, 1986). Under these conditions, qualified students from lower socio-economic background are more likely not to proceed to higher education. Young women more frequently decided not to study, because fields frequently chosen by them were more strongly hit by worsened employment prospects than those predominantly chosen by men. An increased proportion of *Fachoberschule* leavers decided to make use of their vocational skills and to transfer to gainful work after completion of schools.

As already mentioned, a comparison between universities and *Fachhochschulen* by field of study can only refer to economic fields and engineering, because full-fledged study provisions as well as regular careers for graduates are found only in these two fields for both major types of higher education institutions. In both fields, the quotas of young women among new entrant students increased during the period analsyzed at both institutional types:

- In economic fields at universities, 20.5 percent of new entrant students were female in 1976/77, 26.5 percent in 1980/81 and 34.5 percent in 1986/87.
- The corresponding quotas at *Fachhochschulen* differed only marginally: 19.4, 28.9 and 34.3 percent.
- In engineering, only 6.4 percent of new entrant students at universities in 1976/77 were female. This quota rose to 9.4 percent in 1980/81 and 12.0 percent in 1986/87.
- At *Fachhochschulen*, the share of female students among new entrant students in engineering in 1976/77 (9.5 %) and 1980/81 (12.6 %) had been higher than at universities, but this difference almost vanished by 1986/87, when 12.9 percent of new entrant students in engineering at

Fachhochschulen were female (own calculations based on Wissenschaftsrat, 1988, pp. 288-291).

Looking from a different point of view, we note that the quota among all female new entrant students in economic fields opting for *Fachhochschulen* increased from 27.8 percent in 1976/77 to 31.5 percent in 1980/81 and remained almost unchanged until 1986/87 (31.4 percent). These quotas correspond more or less to a moderate increase among male students turning to *Fachhochschulen*. In engineering the corresponding quota of women enrolling at *Fachhochschulen* declined during this period from 68.4 percent via 66.6 percent to 62.2 percent (ibid.). Female students heading for engineering fields opted less frequently for universities than male new entrant students in engineering did in the 1970s. This difference almost disappeared in the 1980s.

3.2 The Selection Process

Access to higher education in the Federal Republic of Germany in terms of access to either universities or *Fachhochschulen* can be characterized in part as allocation subsequent to prior selection and in part as self-selection influenced by various constraints.

First, the most important selection in education in the Federal Republic of Germany takes places after four years or at most six years of schooling. Though no longitudinal data are available, it is justified to estimate that the majority of those attending the 7th grade of a *Gymnasium* in the 1970s and early 1980 eventually enrolled at institutions of higher education, most of them at a university. Of those not attending a *Gymnasium* in their 7th grade, less than 15 percent eventually reached higher education, most of them *Fachhochschulen*. Selection after 4 to 6 grades is decided upon by teachers and parents, whereby parents' rights vary among the *Länder*. It is linked to prior achievement and assumed ability to succeed in future learning in a cognitively demanding and theoretically oriented school environment. The achievement-based selection is intertwined with social selection: Of the 13-14 year old pupils at *Gymnasium* in 1972, only 16 percent were from blue-collar socio-economic background; this quota rose moderately to 18 percent in 1980 (Max Planck Institute for Human Development and Education, 1983, p. 215). These quotas are only marginally different from those of socio-economic background of new entrant students at universities a few years later.

Second, upon completion of secondary education, those completing *Gymnasien* or corresponding schools might opt whether to enrol at a university or a *Fachhochschule*, whereas those completing a *Fachoberschule* have to opt for a *Fachhochschule* and might reach the university only via a "detour" for the

specifically talented and ambitious. As already explained, they might acquire the right to enrol at a university upon completion of the first half or of the complete *Fachhochschule* course programme, but they face a loss of time in addition to the existing risk of whether they will be able to succeed on this upward-mobility route. This option is not more frequently taken than the option of university graduates to pursue graduate studies or other kinds of studies upon completion of a degree.

Third, access to higher education in the Federal Republic of Germany is understood as a process of allocation rather than selection. Every qualified school leaver is entitled to enrol in the field of his or her option. Restrictive admission is considered, as confirmed by rulings of the Federal Constitutional Court, to be exceptional in principle (cf. Becker, 1977; Karpen, 1980; Teichler, 1985). In a substantial number of fields both offered at universities and Fachhochschulen, qualified school leavers are free to enrol at the institution of their choice, in others they might be allocated to another institution, in others they might face a waiting period in order to enrol. The following findings of surveys might support this interpretation:

- According to a survey of new entrant students conducted in 1988, 10 percent each of those enrolling at universities and at *Fachhochschulen* reported that they could not enrol because of admission restriction at the individual institution or the institutional type they would have liked (Lewin/Schacher, 1988, p. 10).
- Corresponding quotas are smaller among students in fields provided both at universities and *Fachhochschulen*. Only about three percent of students from engineering, economic fields and social work surveyed during their final examination period in 1983/84 reported that they did not enrol in the field they liked because they were not qualified because of restricted admissions. Only 5 percent could not enrol at the institution of their choice because they were allocated to another institution by the Central Admissions Office (Teichler et al., 1987, pp. 166-9).

Fourth, the decision eventually taken by a secondary school leaver with general qualification in favour of a university or a *Fachhochschule* is influenced more by the prestige prestige of the universitiy than that of *Fachhochschulen*. This does not mean, however, that almost all *Abiturienten* prefer studying at universities; they might, for example, consider the differences of prestige small, they might assume that their talents are more likely to be rewarded, if they opt for a *Fachhochschule*, or the *Fachhochschule* providing the field of study in which they want to enrol might happen to be closer to their home than a university providing the same field. Some empirical data might illustrate those options and their context:

- According to a survey conducted in 1988, 60 percent of new entrant students at *Fachhochschulen* who were qualified to enrol at universities actually had considered this option as well, i.e. studying at universities. On the other hand, among the new entrants at universities, 25 percent had considered study at a *Fachhochschule* as a possible choice (Lewin/Schacher, 1989, p. 11). Those opting for a *Fachhochschule* named the following aspects most frequently: Orientation toward practice, short duration of study, field of study not available at universities, small institutions and classes (ibid.; cf. also Nigmann, 1989).
- Those with good marks in the *Abitur* are more likely to opt for the university. Again, the differences turn out to be smaller than expected. According to our survey on students graduating in 1983-85, university graduates in mechanical engineering had an average *Abitur* mark of 2.64 (1 = very good; 4 = sufficient), whereas *Fachhochschule* students who had completed academic secondary education, had an 2.83 *Abitur* mark on average. The corresponding figures of average *Abitur* marks for graduates in economic fields were 2.68 and 3.00 (unpublished data). In a student survey conducted in 1984/85, the corresponding figures were 2.6 and 2.8 as well as 2.6 and 2.7; the difference seemed to be even smaller (Bargel et al., 1988, pp. 88-9).

Fifth, almost two thirds of new entrant students state that the vicinity of the higher education institution to their home played a major role in the allocation process. For example, the respective figures reported in 1988 by new entrant students at universities were 61 percent and by those newly enrolled at *Fachhochschulen* 64 percent (Lewin/Schacher, 1989, p. 10). We can estimate that on average the distance between home and the nearest university where the respective field of study can be taken is about the same as the average distance between home and the nearest *Fachhochschule*. Altogether, the number of *Fachhochschulen* is larger than that of universities; this does not, however, lead to lower average distances because more *Fachhochschulen* than universities are specialized in certain disciplines (cf. the location of institutions in Charts 3 and 4).

Sixth, comprehensive universities could serve as institutions offering a "softer" choice than the one between universities and *Fachhochschulen*, thus attracting those prospective students most open or most ambivalent in their decision regarding either type. Evaluation studies show that this seems to be true only for a certain percentage of students at comprehensive universities. The majority of students at these institutions, however, has opted for the institution of higher education closest to their home - as do university and *Fachhochschule* students (see the overview in Cerych et al., 1981; Hitpass/Trosien, 1983).

Chart 3
Location of Universities and Art Colleges 1989

★ Universities, Comprehensive Universities, Teacher Training Colleges
◆ Theological Colleges
▲ Art Colleges

Source: Bundesminister für Bildung und Wissenschaft, 1990, p. 6.

Chart 4
Location of Fachhochschulen 1989

★ General Fachhochschulen
▲ Verwaltungsfachhochschulen

Source: Bundesminister für Bildung und Wissenschaft, 1990, p. 7.

3.3 Employment Prospects of Graduates

Comparisons of employment, careers and work tasks of university and *Fachhochschule* graduates are complicated and frequently confusing in three respects. First, the expectations underlying assessment of graduate employment vary: one might imply that graduates of both types could expect more or less the same socio-economic status, or one could take a certain difference for granted in favour of university graduates. Depending on such a yardstick, an income difference of about 10 percent might be considered either as an indicator of worse or of relatively better employment prospects for *Fachhochschule* graduates. In the subsequent analysis, we assume that some indicators are more suitable for such an evaluative comparison of employment prospects of university and *Fachhochschule* graduates, such as duration of the search period for first regular employment after graduation, unemployment quotas, self-rating of the degree of utilisation of knowledge acquired in higher education etc., than those directly referring to different status levels, such as income, supervisory functions etc.

Second, employment prospects of university and *Fachhochschule* graduates will be completely differently assessed - depending whether we compare all university to all *Fachhochschule* graduates or whether we compare graduates of the respective fields. In the subsequent analysis, we will put emphasis on the comparison within fields of study and occupational areas.

Third, although many surveys had been conducted on the relationships between higher education and employment in the Federal Republic of Germany (see the overviews in Teichler/Sanyal, 1982; Holtkamp/Teichler, 1983; Kaiser et al., 1985b; Bader et al., 1987; Kaiser, 1988), information useful in this context is scarce. Many surveys focus on individual fields, individual institutions or individual types of higher education institution. Also, if we do not refer to surveys on recent graduates, but rather those higher education-trained persons already employed for many years, we have to bear in mind that many of the respondents had studied in predecessor institutions of *Fachhochschulen* or at *Fachhochschulen* during their early stages of development. Therefore, we focus here on a few studies comparing recent graduates from both types of institutions in our subsequent analysis.

The available unemployment statistics in the Federal Republic of Germany, however, do not fit the suggested approach, for they provide only quotas by level of education completed, not by disciplines or occupations. According to recent publications,

- the unemployment quota for persons holding a *Fachhochschule* degree in 1975 was 3.3 percent. It was higher than that for persons holding a univer-

sity degree (1.5 percent); the overall unemployment quota was 4.6 percent at that time.

- In 1980, the unemployment quota of university-trained persons surpassed that of *Fachhochschule*-trained persons slightly: 2.2 percent as compared to 2.1 percent; the total unemployment quota was 3.6 percent.
- During the subsequent three years, unemployment quotas increased almost equally for both types. In 1983, it was 4.9 percent for university-trained persons and 5.0 percent for *Fachhochschule* graduates; the total unemployment quota was 9.0 percent.
- Thereafter, unemployment of *Fachhochschule* graduates declined, whereas unemployment of university graduates rose. The respective quotas in 1987 were 4.0 percent for *Fachhochschule*-trained persons and 5.7 percent for university graduates; the total unemployment quota remained 9.0 percent (see Table 10).

Table 10
Unemployment Quotas by Educational Attainment, September 1975-87
(percentage)

Year	Unskilled	Vocational training	Higher vocational training	Fachhoch-schule	University	Total
1975	7.5	3.2	2.2	3.3	1.5	4.6
1976	6.4	3.1	2.6	3.4	1.9	4.2
1977	6.8	3.0	2.5	3.2	2.1	4.2
1978	6.9	2.7	2.2	3.4	1.9	3.9
1979	6.0	2.3	1.8	2.1	1.9	3.3
1980	6.9	2.4	1.8	2.1	2.2	3.6
1981	10.3	3.6	2.5	2.9	3.0	5.4
1982	13.6	5.6	3.7	4.4	3.9	7.7
1983	16.0	6.6	4.2	5.0	4.9	9.0
1984	16.3	6.8	4.1	4.7	5.3	9.1
1985	17.1	6.7	3.7	4.5	5.4	9.1
1986	17.4	6.2	3.4	4.0	5.2	8.8
1987	18.4	6.4	3.4	4.0	5.7	9.0

Source: Krupp, 1988, p. 243.

The presentation of unemployment data reflects difficulties in continuous updating of occupational statistics needed for calculating quotas of unemployment. Therefore, we choose a different measure (cf. V. Baethge, 1986): the ratio of unemployed to the number of recent graduates of the same year according to field of study and to type of higher education institution. This calculation indicates that unemployment of university graduates in engineering and economic fields had already been somewhat higher in 1980 than for *Fachhochschule* graduates 1980. The respective ratios increased for all these groups until 1986 without substantially changing the overall pattern:

- The ratio of total unemployed mechanical engineers to recent graduates from mechanical engineering in 1980 was 0.32 for university graduates and 0.22 for *Fachhochschule* graduates. The quotas for 1986 were 0.46 and 0.31.
- The corresponding ratios in electrical engineering were 0.30 and 0.17 in 1980 as well as 0.38 and 0.32 and 1986.
- The ratios in economic fields were 0.36 and 0.24 in 1980 as well as 0.56 and 0.36 in 1986.

It might be added that *Fachhochschule* graduates in social work face a higher risk of unemployment. The corresponding ratio was 0.50 in 1980 and increased to 1.20 in 1987 (own calculation based on Tessaring, 1988a, p. 8, and Wissenschaftsrat, 1988, pp. 363-372).

According to surveys of graduates, among those graduating in 1979 three percent each of university graduates and *Fachhochschule* graduates reported 1 1/2 years after graduation that they were unemployed; among the 1984 graduates, however, more *Fachhochschule* graduates were unemployed 1 1/2 years after graduation than university graduates (8 % compared to 5 %; see Hochschul-Informationssystem, 1987, p. 214). One has to bear in mind, though, that a higher proportion of university graduates than *Fachhochschule* graduates opt for advanced studies - among them some because of the difficulties they faced in finding employment (see Teichler/Winkler, 1990, pp. 41-4).

According to another survey of graduates in 1983-85 from selected institutions, 15 percent of university graduates in mechanical engineering and 17 percent of *Fachhochschule* graduates from the same field reported that they had been unemployed - mostly for a brief period - during the first two years after graduation; after two years, one percent of each group was unemployed. Among graduates from economic fields, 14 percent of university graduates and 23 percent of *Fachhochschule* graduates experienced unemployment during the first two years after graduation; after two years, two percent of university graduates and three percent of *Fachhochschule* graduates were unemployed.

Even in social work, surprisingly, a larger proportion of *Fachhochschule* graduates (50 percent) faced unemployment than of university graduates (27 percent) during the first two years. Two years after graduation, 15 and 10 percent respectively were unemployed (see Teichler/Winkler, 1990, pp.23-41). This finding is surprising, because course programmes in social work had been recently established at universities; their graduates still face considerable problems in entering regular social work careers. In part it is due to the fact that *Fachhochschule* graduates are more likely to name short waiting periods "unemployment" than university graduates from this field do.

The transition period from graduation until first regular employment lasted 3.7 months on average for mechanical engineering graduates, 4.0 months for graduates from economic fields and 5.4 months for social work graduates. Whereas in economic fields and social work the duration of the transition period does not differ according to type of higher education institution, it was longer for *Fachhochschule* graduates in mechanical engineering (4.5 months) than for univerisity graduates in the same field (2.9 months; see ibid., 1989, p. 31).

Two years after graduation, a higher proportion of university graduates in mechanical engineering and economic fields considered their position appropriate to their education than *Fachhochschule* graduates from the same fields; the respective quotas were 74 and 54 percent in the case of mechanical engineering and 61 and 55 percent in the case of economic fields. Also *Fachhochschule* graduates more frequently than university graduates stated that they hardly or not at all could hardly make use of their qualification acquired, or not at all; the respective figures were 26 and 14 percent in mechanical engineering (the corresponding quotas were 23 and 15 percent for engineering graduates in a follow-up survey on school leavers 1976 nine years later; see Stegmann/Kraft, 1987, p. 440), and 22 and 20 percent in economic fields. On the other hand, university graduates from social work stated substantially less frequently than *Fachhochschule* graduates that their position was appropriate (28 % as compared to 56 %) and slightly less frequent that they could utilize their qualifications (85 % as compared to 89 %; see Table 11). In this case, the effects of the lack of established career patterns for university graduates in social work become visible; this notwithstanding, a surprisingly high proportion of university graduates in social work succeed in getting assignments which allow them to establish links between qualifications and job tasks.

Table 11
Utilization of Competencies on the Job: Expectation at Time of Graduation, Realized two Years after Graduation and Future Expectation, by Type of Higher Education Institution (percentage)

Utilization		Mechanical engineering Uni	FH	Economic fields Uni	FH	Social work Uni	FH	Total
Mostly/partly	Expectation	80	78	72	78	84	77	76
	Realized	86	74	79	79	85	89	82
	Future	81	74	82	81	71	74	79
Hardly/no	Expectation	16	18	26	18	10	15	20
	Realized	14	26	20	22	15	10	18
	Future	11	18	13	11	8	7	11
Don't know	Expectation	4	4	2	3	5	9	4
	Future	9	9	5	7	21	19	10

Source: Teichler/Winkler, 1990, p. 163.

In another survey on 1984 graduates one year after graduation, university graduates in mechanical and electrical engineering were somewhat more satisfied than the *Fachhochschule* graduates of the respective fields regarding income (66 % as compared to 58 %) and the opportunities of utilizing their competences (57 % and 50 % respectively); about the same degree of satisfaction could be noted regarding work conditions and job security. In the case of graduates from economic fields, university graduates were more satisfied than of those from *Fachhochschulen* regarding the job tasks (75 % and 61 %), the utilization of their knowledge (59 % and 47 %) as well as working conditions (71 % and 55 %). As regards job security and income, university graduates from economic fields were slightly more satisfied than *Fachhochschule* graduates (Leszczensky/Nigmann, 1988, p. 23).

In comparing fields of study among *Fachhochschule* graduates, it is not surprising to note that a larger proportion of those from social work face difficulties in job search than those from mechanical engineering and economic fields. Their income two years after graduation also is substantially lower (33,000 DM annually) than those from mechanical engineering (48,000 DM) and from economic fields (49.000 DM; see Teichler/Winkler, 1990, p. 93). As regards ap-

propriate positions two years after graduation, however, the assessment of *Fachhochschule* graduates from all three fields does not differ significantly. Finally, though obviously having attained a lower status on average, an even larger proportion of *Fachhochschule* graduates from social work feel that they utilize the knowledge acquired during their studies (89 percent) than *Fachhochschule* graduates from economic fields (79 percent) and from mechanical engineering (74 %) (ibid., p. 163).

Two years after graduation, employed university graduates in mechanical engineering earned 12 percent more than do *Fachhochschule* graduates in the same field. The corresponding income difference was 7 percent in the case of social work and 5 percent in the case of economic fields (ibid., p. 93).

According to microcensus data from 1982, university-trained persons had on average a 14 percent higher income than persons having completed course programmes at *Fachhochschulen* or their predecessor institutions - 11 percent in the case of men and 28 percent in the case of women, whereby different patterns of fields of study play a significant role (see Tessaring, 1984, p. 7).

If all university graduates took first-rank career paths in the private and in the public sector and all *Fachhochschule* graduates second-rank careers, university graduates certainly would earn on average at least 20 percent more than *Fachochschule* graduates. The actual figures both for recent graduates and for all employed graduates suggest that university graduates in engineering and economic fields have a better chance of access to high-level careers than *Fachhochschule* graduates, but also indicate that there is an overlap between careers of graduates from the two major types of higher education institutions.

According to interviews conducted in 1981/82 with heads of personnel offices in large private enterprises in the Federal Republic of Germany, there was not one of the 47 enterprises in which university graduates and *Fachhochschule* graduates had the same career opportunities; in 20 cases, a considerable overlap of career opportunities was reported, and in 22 enterprises clearly distinct occupational tasks and career paths were arrangend for the respective type of graduates (see Teichler et al., 1984, p. 113; Buttgereit, 1984).

An overlap of university graduates' and *Fachhochschule* graduates' careers is perceived by recent graduates as well. Two years after graduation, 27 percent of those having graduated from universities in engineering reported that their position could be filled by either a university or a *Fachhochschule* graduate, and 8 percent considered a *Fachhochschule* degree to be more appropriate; on the other hand, 26 percent of the *Fachhochschule* graduates considered both types of degrees possible for their position, and 2 percent considered a university degree to be more suitable. The corresponding proportions were 26 percent and 4 percent as well as 35 and 2 percent in the

case of economic fields. In this context, it is interesting to note that graduates from both levels at Gesamthochschulen more frequently state than both university and *Fachhochschule* graduates that their position could be filled both by a university or a *Fachhochschule* graduate (see Table 12).

Table 12
Suitable Level of Education for Jobs Held by Graduates - According to the View of Graduates (percentage)

Suitable level of education	Mechanical engineering					Economic fields					Social work				
	Uni	GH I	GH II	FH	Total	Uni	GH I	GH II	FH	Total	Uni	GH I	FH	Total	Total
University degree	58	33	6	2	30	51	44	23	2	40	30	1	5	8	31
University degree or Fachhochschule degree	27	67	33	26	28	26	42	49	35	30	38	47	23	33	22
Fachhochschule degree	8	-	39	57	31	4	-	9	33	10	18	29	64	45	30
No degree needed	5	-	21	14	10	20	15	20	30	21	13	22	8	13	17
Other	2	-	-	1	1	-	-	-	-	-	-	1	-	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Teichler/Winkler, 1990, p. 160.

Uni: University graduates
GH I: Comprehensive university lower level graduates
GH II: Comprehensive university higher level graduates
FH: Fachhochschule graduates

Information is scarce on long-term careers differences according to type of higher education completed. According to surveys conducted by a consulting firm, 40 percent of high-level managers in private enterprises were university-trained in 1972; 18 percent had completed training at predecessor institutions of *Fachhochschulen*, and 42 percent were non-graduates. In 1981, the corresponding figures were 48, 19, and 33 percent (see Table 13; cf. also information on qualification requirements and recruitment criteria in Tables 14). These data suggest an up-grading trend in the employment system in favour of university graduates rather than *Fachhochschule* graduates. One has to bear in mind, though, that these persons were trained before the formal upgrading of engineering schools and higher vocational schools to *Fachhochschulen*; we do not know yet whether the establishment of this second type of higher education institutions had a substantial impact on their graduates' opportunity of reaching high management positions.

Table 13
Educational Background of Managers and Top Level Employees in Private Enterprises 1972 and 1981 (percentage)

Position	University graduates	Fachhochschule graduates	Non-graduates	Total
Managers 1972	40	18	42	100
Managers 1981	48	19	33	100
1st and 2nd rank employees 1972	18	23	59	100
1st and 2nd rank employees 1981	26	25	49	100
1st rank employees 1981	33	24	43	100
2nd rank employees 1981	18	27	55	100

Source: Adapted from Evers/von Landsberg 1982, pp. 26-8.

In summing up the findings presented we have to conclude that many public statements made in the Federal Republic of Germany in the 1980s about the presumed bright career prospects of *Fachhochschule* graduates in comparison with those of university graduates are overstated. In many cases we note a deliberate neglect of the fact that the labour market for graduates in the Federal Republic of Germany varies primarily according to fields to study, not predominantly according to type of higher education institution, and differences according to fields have substantially risen in the late seventies and even more in the eighties. In the case of the major fields provided by *Fachhochschulen*, engineering and economic fields belonged to those with relatively favorable employment prospects in the 1980s on the one hand and social work on the other hand to those in which employment prospects worsened during the 1980s. This notwithstanding, a surprisingly high proportion of graduates from social work report that they can utilize their knowledge acquired.

Surveys show that engineering graduates from *Fachhochschulen* face more frequently a period of unemployment during the search period, spend a longer period of transition from higher education to employment and take over more

Table 14
Weight of Criteria in Recruitment of Fachhochschule Graduates

Position	Mean*
a) Certain fields	1.4
b) Good marks	1.9
c) Theme of thesis	2.9
d) Certain institution	3.6
e) Certain profession	3.7
f) Certain educational path	2.6
g) Vocational training	1.9
h) Occupational experience while studying	2.3
i) Experience abroad	3.3
j) Foreign language proficiency	2.6
k) General education/culture	2.1
l) Relative youth	3.1
m) Marital status	4.2
n) Social background	4.5
o) Regional mobility	2.4
p) Career ambitions	2.0
q) Expected income and position	2.3
r) Hobbies, extra-occupational interests	3.3
s) Appearance, manners	1.8
t) Abilities of communication, oral expression	1.9

* Scale from 1 = "very important, necessary" to 5 = "not important at all"

Source: von Landsberg, 1985, p. 48

frequently positions they do not consider fully appropriate, report more frequently than university graduates that they cannot make use of their knowledge acquired in higher education, and are to a lesser extent satisfied with their work. In the case of graduates from economic fields, those differences are partly less pronounced and more pronounced in a few aspects, but

obviously employment prospects for university graduates in these fields are also more favourable than those of *Fachhochschule* graduates. The data available confirm that the range of positions and income of university graduates and *Fachhochschule* overlap - in the case of graduates from economic fields more than in the case of engineering graduates. Yet, university graduates kept an edge in income and access to high-level positions, whereby interpretations naturally vary whether this difference is "high" or "low".

4

A Statistical Overview

The total number of students (both German and foreign) at institutions of higher education was, as Table 15 shows, 291,000 in 1960. This includes estimates of students at the predecessor institutions of *Fachhochschulen* (established in 1970/71). In 1970, the total number had risen to 510,000; in 1975, it was 841,000, and in 1980, it surpassed one million (1,044,000). It finally increased up to 1,411,000 in 1987. Of all students in 1975, 17 percent were enrolled at *Fachhochschulen*. This proportion rose to 19 percent in 1980 and to 23 percent in 1987.

Table 15
Students at Institutions of Higher Education in the Federal Republic of Germany 1960-1987 (absolute numbers in thousands and percentages)

Type of institution	1960	1965	1970	1975	1980	1985	1987
Universities*	238.4	299.7	410.1	680.2	823.9	1.015.1	1.060.0
	(81.9)	(87.0)	(80.3)	(80.9)	(87.9)	(75.9)	(75.2)
Fachhoch-schulen**	44.2	76.0	89.5	145.2	202.0	301.3	328.6
	(15.2)	(19.7)	(17.5)	(17.3)	(19.3)	(22.5)	(23.3)
Art academies	8.5	8.7	10.9	15.4	18.3	21.7	22.2
	(2.9)	(2.3)	(2.1)	(1.8)	(1.8)	(1.6)	(1.6)
Total	291.1	384.4	510.5	840.8	1,044.20	1,338.0	1,410.8
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Source: Federal Ministry of Education and Science, 1988a, p. 69.

* Including comprehensive universities, teacher colleges and theological seminaries
** Including predecessor institutions

The total number of new entrant students was, as Table 16 indicates, 79,000 in 1960, 126,000 in 1970 and 168,000 in 1985. It rose further to 195,000 in 1986 and 230,000 in 1987. We note a smaller increase of the numbers of new entrant students than those of all students, notably in the late seventies and during the eighties, which is due to an increasing duration of study during that period.

Table 16

New Entrants according to Type of Institution of Higher Education

Year[1]	New Entrants					
	Total		of which			
			Universities	Colleges of Art and Music	Fachhochsschulen	
					Total	of which Colleges of Public Administration
	Thousand	Per Cent[2]	Thousand			
	German and Foreign					
1960	79.4	7.9	60.0	2.6	16.8	–
1965	85.7	13.3	61.3	2.5	21.9	–
1970	125.7	15.4	91.6	3.4	30.5	–
1975	166.6	19.5	119.9	2.8	43.8	1.4
1976	168.1	19.1	119.0	2.6	46.5	3.0
1977	165.5	18.3	118.2	2.7	44.5	3.6
1978	172.5	18.4	125.3	3.3	43.9	4.3
1979	177.7	18.2	125.2	3.0	49.6	7.8
1980	195.0	19.1	135.6	3.1	56.3	11.5
1981	216.6	20.9	151.5	3.0	62.1	11.1
1982	226.1	21.3	155.2	3.1	66.8	10.6
1983	233.0	21.5	160.1	2.9	69.9	9.7
1984	221.3	20.6	151.5	2.9	66.9	9.1
1985	207.7	19.5	141.3	3.0	63.4	9.9
1986	210.8	20.2	142.7	2.7	65.4	10.4
1987	229.7	22.9	155.7	2.7	71.3	11.5
	German					
1960	74.2	•	55.6	2.3	16.3	–
1965	80.3	•	57.4	2.1	20.8	–
1970	119.8	•	87.5	2.9	29.4	–
1975	155.9	19.6	111.8	2.3	41.8	1.4
1976	157.4	19.0	110.8	2.1	44.5	3.0
1977	154.7	18.2	109.8	2.2	42.6	3.6
1978	161.4	18.3	116.9	2.6	41.9	4.3
1979	165.3	18.1	115.6	2.5	47.3	7.8
1980	183.2	19.5	126.3	2.6	54.2	11.5
1981	203.7	21.2	141.5	2.6	59.6	11.1
1982	211.9	21.6	145.0	2.6	64.3	10.6
1983	219.7	21.9	149.9	2.5	67.3	9.7
1984	207.0	20.8	140.1	2.4	64.4	9.1
1985	192.9	19.7	129.3	2.4	61.2	9.9
1986	196.7	20.5	131.2	2.3	63.2	10.4
1987	213.4	23.0	142.5	2.2	68.7	11.5

[1] Summer and following winter semester
[2] In per cent of the average year in the population aged 19 to under 21

Source: Federal Ministry of Education and Science, 1988a, p. 68

The proportion of new entrant students at *Fachhochschulen* was 26 percent in 1975, 29 percent in 1980 and 31 percent in 1987. The higher quota of new entrants than that of all students at *Fachhochschule* reflects the shorter periods of study at *Fachhochschulen* than at universities.

The quota of new entrant students at all institutions of higher education of the corresponding age cohort (average of 19-21 years old) increased, as Table 16 also shows, from 7.9 percent in 1960 to 15.4 percent in 1970. After a further increase to 19.5 percent in 1975, a stagnation could be noted for a decade. In 1985, the quota was also 19.5; thereafter, an increase to 22.9 percent in 1987 could be noted (including foreign new entrant students and foreign residents in the Federal Republic of Germany). The quota of those beginning studies at *Fachhochschulen* increased from 5 percent in 1975 to 6 percent in 1985 and 7 percent in 1987.

Until 1983, the absolute number of new entrant students grew substantially, whereas the quota of new entrants among the corresponding age group grew to a lesser extent or stagnated. This is due to demographic reasons. The post-war baby boom in the Federal Republic of Germany was relatively late and reached its peak in 1964. Given the average age of 21-22 years of new entrant students, a decline in the absolute number of new entrant students would have to be expected from 1986, if the enrolment quota did not grow.

According to estimates published in 1987 by the Standing Conference of Ministers of Education, the number of qualified secondary school leavers will decrease from 290,000 in 1987 to 193,000 in 1993 and thereafter remain more or less stable. The number of new entrant students was expected to decrease from 230,000 to 129,000-165,000 in 1995 (Federal Ministry of Education and Science, 1988a, pp. 72). Thereby, a slight decline in the percentage of new entrants students enrolling at *Fachhochschulen* is assumed: from about 31 percent in 1987 to 28 percent in 2,010. The expected impacts of these predicted trends on the total numbers of students and of graduates are presented in Table 17. Accordingly, student numbers are expected to drop by 34-48 percent from 1987 to the year 2,000. The number of graduates is expected to decrease by 8-28 percent from 1987 to the year 2,005. The lesser decline of graduates reflects the fact the the "baby boom" generation around 1964 had not yet reached the average age of graduation in 1987; rather, the maximum number of graduates is expected for 1990.

The total number of secondary school leavers qualified to enrol at institutions of higher education was 89,000 in 1970, as Table 18 shows. The increase to 172,000 in 1975 is to more than half due to the establishment of *Fachoberschulen* as a new route of access to higher education. The total number of qualified secondary school leavers was 219,000 in 1980 and 291,000 in 1986.

Table 17

Forecast of Number of Students and Graduates according to Type of Institution of Higher Education (Thousands)

Year	Students			University Examination Passed (Persons)		
	Total	of which in		Total	of which in	
		Universities and Colleges of Art and Music	Fachhochschulen		Universities and Colleges of Art and Music	Fachhochschulen
	Actual Figures					
1987	1411	1082	329	150[1])	100	50
	Forecast (Estimate by the Standing Conference of Ministers of Education of the Laender; KMK Documentation 103)					
1987	1286–1341	1016–1057	270–285	172	116	56
1988	1264–1371	1003–1081	261–290	178	121	57
1989	1231–1385	982–1095	249–290	183	125	58
1990	1188–1381	951–1096	237–285	185–189	129	56–60
1991	1139–1363	914–1086	225–277	183–190	130–131	53–59
1992	1082–1328	871–1063	211–265	180–193	128–133	52–60
1993	1021–1276	823–1027	198–249	176–200	128–139	48–61
1994	935–1194	751– 963	184–231	169–201	120–140	49–61
1995	872–1126	713– 927	159–199	156–189	113–134	43–55
1996	833–1075	681– 884	152–191	146–189	107–140	39–49
1997	794–1023	646– 837	148–186	147–189	110–143	37–46
1998	753– 967	607– 785	146–182	133–172	98–128	35–44
1999	736– 945	592– 765	144–180	124–159	90–116	34–43
2000	727– 933	583– 753	144–180	118–152	85–110	33–42
2005	721– 925	577– 745	144–180	108–138	75– 97	33–41
2010	730– 937	583– 754	147–183	108–139	76– 98	32–41

[1]) 1986

Source: Federal Ministry of Education and Science, 1988a, p. 73

Table 18
Secondary School Leavers Qualified for Higher Education by Type of Qualification and Sex and Ratio of Qualified School Leavers to Corresponding Age Group 1960-1986

Year	Average of 18 - 21 years old		Secondary school leavers qualified for higher education						
			Total			Among them: Qualified for Uni		Qualified for FH	
	German and foreigners	German	Absolute	% of col. 1	% of col. 2	Absolute	% of col. 3	Absolute	% of col. 3
	1	2	3	4	5	6	7	8	9
1960	994,300	-	55,370	5.6	-	53,370	100.0	-	-
1965	720,500	-	51,698	7.2	-	51,698	100.0	-	-
1970	821,600	-	89,165	10.9	-	89,165	100.0	-	-
1975	850,300	783,400	172,174	20.2	-	125,524	72.9	46,650	27.1
1980	975,400	910,800	218,532	22.4	24.0	167,960	76.9	50,572	23.1
1985	1,010,900	989,600	298,080	27.8	30.1	230,271	77.3	67,809	22.7
1986	1,060,600	977,200	290,831	27.4	29.8	224,215	77.1	66,616	22.9

Source: Bargel et al., 1988, p. 136

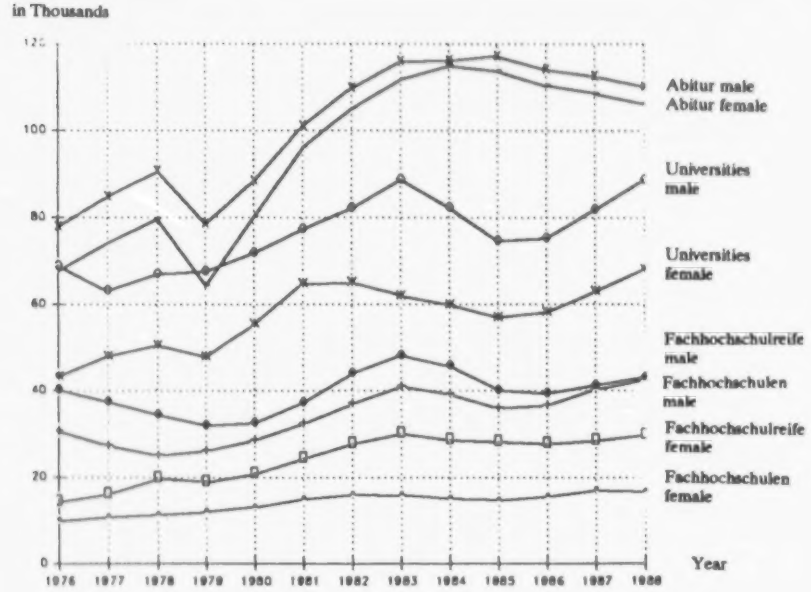
The proportion of all qualified secondary school leavers completing *Fachoberschule* was 27.1 percent in 1975. It declined to 23.1 percent in 1980 and 22.9 percent in 1986.

During the 1970s and 1980s four important changes in transfer from secondary to higher education could be observed, which were already reported above:

- First, for a long period, the percentage of qualified secondary school leavers eventually enrolling at institutions of higher education decreased (see Chart 5). Of the qualified secondary school leavers in 1972, 59 percent enrolled during the first year and 92 percent within three years. The corresponding quotas for 1983 were - according to official statistics - 31 and 65 percent (Wissenschaftsrat, 1988, p. 293). On the basis of panel-surveys, the *Hochschul-Informations-System* estimated that gross transfer quota to higher education was 83 percent for qualified secondary school leavers in 1976, 79 percent in 1978 and 80 percent in 1980. It declined according to those estimates to 72 percent of the respective cohort in 1983 and is assumed to decline to 70 percent of qualified school leavers in 1986 (Lewin et al., 1988, p. 4).
- Second, the average time span between the completion of secondary education and enrolment in higher education increased. According to the estimates by *Hochschul-Informations-System*, 44 percent - out of 83 percent of qualified school leavers in 1976 eventually enrolling in higher education - actually enrolled in the first half year; among the 70 percent of 1986 school leavers expected to enrol, 25 percent actually did in the first half year (ibid.). Or looking from another angle: only 43 percent each of new entrant students 1987 at universities and *Fachhochschulen* had completed secondary education during the same year (Ministry of Education and Science, 1988a, pp. 84-5). Thus, the average age of new entrant students increased from 20.8 years in 1975 to 21.7 years in 1987 (Bundesminister für Bildung und Wissenschaft, 1988, pp. 162-3.
- Third, the type of upper secondary education chosen predetermines to a lesser extent the transfer to higher education than it did in the past. Of German first-semester students at *Fachhochschulen* in 1975, only about 16 percent were qualified to enrol at universities as well. This proportion increased to 42 percent in 1979 and even to 52 percent in 1987 (Bundesminister für Bildung und Wissenschaft, 1981, pp. 140-1; Bundesminister für Bildung und Wissenschaft, 1988, pp. 170-1). On the other hand, the percentage of qualified secondary school leavers not eventually enrolling at institutions of higher education rose from 1976 to 1982 slightly more among *Fachoberschule* leavers than among *Abiturienten* (Durrer/Minks, 1989, p. 16).

- Fourth, the quota of women among all *Abiturienten* increased from 42.1 percent in 1973 to 47.5 percent in 1980 and 49.2 percent in 1987 and among *Fachoberschule* leavers from 21.5 percent to 38.5 and 41.4 percent. The quotas of women among new entrant students at universities were 44 percent in 1980 and 43 percent in 1987 as well as 32 and 33 percent at *Fachhochschulen*. Thus, the increasing share of female qualified secondary school leavers did not translate into a rising quota among students during the 1980s (see also Chart 5).

Chart 5
Qualified Secondary School Leavers according to Type of Qualification and New Entrant Students According to Type of Institution by Sex, 1976-88



Source: Lewin/Schacher, 1989, p. 2.

The total number of female students was 70,000 in 1960, 130,000 in 1970 and 283,000 in 1975. It increased further to 383,000 in 1980 and 536,000 in 1987. The proportion of woman among all students increased from 24 percent in 1960 to 26 pecent in 1970 and 34 percent in 1975. It was 37 percent in 1980 and increased only to 38 percent in 1987 (Ministry of Education and Science, 1988a, pp. 69 and 71).

Changes in the number of new entrant students at universities according to field of study are demonstrated in Chart 6. During the period from 1972 to 1988, the absolute number of new entrants students in the humanities, economic and social sciences, natural sciences, engineering and medicine more or less doubled. The number of new entrant students in law, agriculture and the arts increased only to a much lesser extent, and the number of students in teacher training sharply declined.

At *Fachhochschulen*, most students are enrolled in three areas: engineering, economic fields and social work, as Table 19 shows. Among all new entrant students of *Fachhochschulen* (excluding *Verwaltungsfachhochschulen*)

- 53.8 percent were enrolled in engineering fields in 1976/77; the proportion enrolling in these fields decreased to 42.4 percent in 1980/81, but rose again to 51.7 percent in 1986/87;
- 12.3 percent were enrolled in economic fields (including industrial engineering) in 1976/77; this proportion increased slightly to 13.4 percent in 1980/81 and substantially during the eighties to 20.7 percent in 1986/87;
- 14.5 percent were in enrolled in social work in 1976/77, 15.9 percent in 1980/81, and finally 11.8 percent in 1986/87.

Among the remaining fields, the largest ones are public administration, design, computer science, chemistry, horticulture and landscape management, home economics and dietetics, and finally agriculture. Almost 20 percent of all students at *Fachhochschulen* are enrolled in these eight fields.

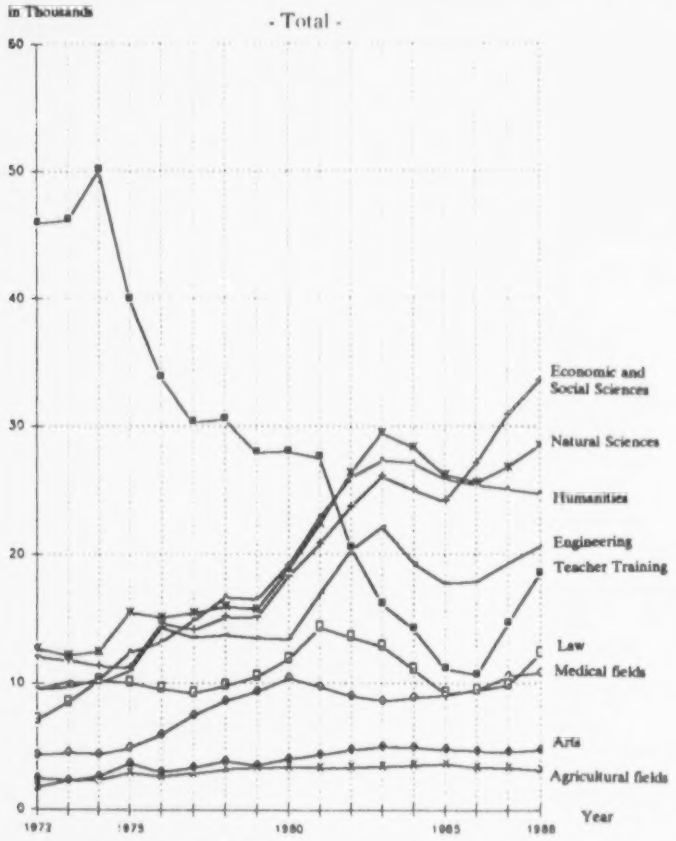
At *Verwaltungsfachhochschulen* the total number of new entrant students in 1986/87 was 11,410 (among them 43.8 % women). Most were enrolled in public administration (8,342, i.e. 73.1 %) and in economic fields (2.831, i.e. 24.8 %). The remaining 237 students (2.1 %) were enrolled in forestry, the humanities and geology.

The distribution of the total number of students according to areas of study for both universities and *Fachhochschulen* is shown in Table 20. Referring to the fields strongly represented in both institutional types, we note that in 1987

- 12.3 percent of university students and 48.7 percent of *Fachhochschule* students (20.8 percent of all higher education students) were enrolled in engineering fields.

- 25.0 percent of university graduates and 36.7 percent of *Fachhochschule* students (27.8 percent of all higher education students) were enrolled in economic and social science fields.

Chart 6
Fields of Study of New Entrant Students at Universities 1972-88



Source: Lewin/Schacher, 1989, p. 3.

Table 19
German New Entrant Students at Fachhochschulen by Areas of Study and Selected Fields 1976/77, 1980/81 and 1986/87

Fields of study	1976/77	1980/81	1986/87
(1) Fachhochschulen without Verwaltungsfachhochschulen			
Humanities	1,212	910	1,122
among them:			
Library Science	227	412	625
Interpretor, translator	198	227	-
Arts, music	35	180	175
Design	1,931	2,187	2,227
Social sciences	16,165	25,451	20,413
among them:			
Social work	6,953	8,994	7,419
Economic fields	5,181	4,230	10,941
Industrial engineering	735	1,163	2,053
Mathematics	113	179	221
Computer sciences	448	1,060	2,496
Physics	-	171	325
Chemistry	264	543	823
Agricultural and food sciences	1,976	1,999	2,462
among them:			
Agriculture	609	637	834
Foresting	379	221	187
Food science	452	471	682

(Table 19 continued)

Fields of study	1976/77	1980/81	1986/87
Engineering	25,814	24,064	32,408
among them:			
Mechanical engineering	11,440	10,013	15,238
Electrical engineering	7,396	6,061	9,307
Architecture	2,942	4,405	4,227
Civil engineering	3,082	2,660	2,841
Surveying	878	754	657
Total	47,959	56,744	62,670
(2) Verwaltungsfachhochschulen			
Humanities			92
Social sciences			11,173
among them:			
Public administration, Law			8,342
Economic fields			2,831
Geology			16
Forestry			129
Total			11,410
TOTAL	47,959	56,744	74,080

Source: Wissenschaftsrat, 1988, pp. 291-2.

Table 20

Students according to Areas of Study, Type of Institution of Higher Education and Sex

Year[1]		Students (German and Foreign)			
		Total[2]	of which		
			Languages, Arts, Sports	Commerce Economics, Social Sciences	Mathematics, Science
		Universities and Colleges of Art and Music			
1975	Total	695548	222631	145878	136078
	Female	250060	123058	35099	44025
1980	Total	842207	256754	188252	153752
	Female	323635	145001	55681	52258
1985	Total	1036774	289441	250050	191581
	Female	419642	172166	86383	62465
1986	Total	1055231	289041	258979	195901
	Female	428248	173376	90545	63258
1987	Total	1082164	290627	270668	203109
	Female	440468	175111	95968	65437
		Fachhochschulen			
1975	Total	142209	2743	49032	3277
	Female	33142	1796	19330	565
1980	Total	202003	2846	93550	6281
	Female	59563	2042	38051	1508
1985	Total	301268	4663	109584	14399
	Female	87007	3638	49908	3110
1986	Total	312468	4792	113363	15893
	Female	90184	3752	51592	3475
1987	Total	328625	5837	120503	17450
	Female	95827	4521	54896	3893
		All Institutions of Higher Education			
1975	Total	840757	225374	194910	139355
	Female	283202	124854	54429	44590
1980	Total	1044210	259600	271802	160033
	Female	383198	147043	93732	53766
1985	Total	1338042	294104	359634	205980
	Female	506649	175804	136291	65575
1986	Total	1367699	293833	372342	211740
	Female	518432	177128	142137	66733
1987	Total	1410789	296464	391171	220559
	Female	536295	179632	150864	69330

[1] Winter semester
[2] Including those where no data are available

Table 20 (cont.)

Students according to Areas of Study, Type of Institution of Higher Education and Sex (cont.)

Students (German and Foreign)						Year[1])
of which						
Engineering	Human Medicine		Veterinary Medicine	Agriculture, Forestry, Food	Art	
	Total	of which Dentistry				
			Universities and Colleges of Art and Music			
85017	53128	7291	3437	14481	34898	1975
5474	15270	1505	1198	7079	18857	
94830	78757	9582	5206	21688	42593	1980
7784	27314	2391	2262	9886	23267	
125143	96293	12226	6548	25226	52098	1985
13506	39487	3564	3603	11757	30052	
128505	97952	12572	6565	25327	52719	1986
14250	40516	3733	3734	11770	30655	
133313	99169	12990	6785	25353	52907	1987
15278	41791	4021	3969	11759	31016	
				Fachhochschulen		
78280	–	–	–	3848	8029	1975
6202	–	–	–	1209	4040	
92025	–	–	–	6973	10328	1980
9492	–	–	–	2904	5566	
149340	–	–	–	10057	13225	1985
18190	–	–	–	4677	7484	
154374	–	–	–	10327	13683	1986
18744	–	–	–	4806	7787	
160013	–	–	–	10666	14156	1987
19467	–	–	–	4999	8051	
			All Institutions of Higher Education			
163297	53128	7291	3437	18329	42927	1975
11676	15270	1505	1198	8288	22897	
186855	78757	9582	5206	28661	52921	1980
17276	27314	2391	2262	12790	28833	
274483	96293	12226	6548	35283	65323	1985
31696	39487	3564	3603	16434	37536	
282879	97952	12572	6565	35654	66402	1986
32994	40516	3733	3734	16576	38442	
293326	99169	12990	6785	36019	67063	1987
34745	41791	4021	3969	16758	39067	

Source: Federal Ministry of Education and Science, 1988a, pp.78-9.

There are no reliable data on student drop-out. Long-term comparisons of the number of new entrant students and the number of graduates lead to the conclusion that drop-out rates are higher than 20 percent. Surveys conducted between 1980 and 1984 on persons leaving higher education with or without a degree indicated beween 12 percent and 20 percent drop-outs. According to the 1984 survey, the drop-out quota was 16 percent: 16 percent at universities (without teacher training), 18 percent in teacher training and 14 percent at *Fachhochschulen* (see Hochschul-Informations-System, 1987, pp. 173-9). Whereas at *Fachhochschulen* and in teacher training drop-out quotas for men and women do not significantly differ, the drop-out quota of women at universities (except teacher training) was 25 percent as compared to 11 percent among men. Of persons leaving institutions of higher eduation without a degree, 69 percent of those from universities, 45 percent of those from teacher training and 73 percent of those from *Fachhochschulen* dropped out during the first two years.

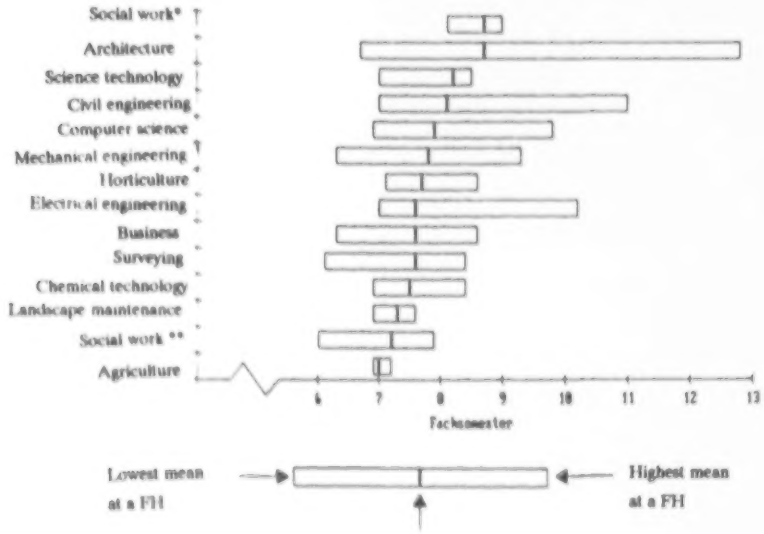
As already reported, the current debate in the Federal Republic of Germany regarding efficiency of studies focusses on the duration of studies. As shown in section 2.2, new entrant students at universities in 1987 were on average 21.3 years old, and new entrant students at *Fachhochschulen* were 22.4 years old. Those completing university-level course programmes in 1986 had spent 7.0 years since first enrollment and those completing *Fachhochschule* or other short programmes 4.3 years. The average age was 27.9 years for those being awarded a university degree and 26.5 years for those being awarded a *Fachhochschule* degree.

The duration of studies is presented in Table 3 (cf. above) in three categories:

- duration from first enrollment up to the successful completion of studies,
- duration according to the total number of semesters enrolled (HS), and
- duration according to the number of semesters enrolled in the field successfully completed.

Graduates from *Fachhochschulen* in mechanical engineering had taken 4.6 years and those in electrical engineering 4.5 years, those in social work 4.3 years and those in economic fields 4.1 years (see also Chart 7). In comparison, graduates from universities in mechanical engineering had taken 6.9 years, those in electrical engineering 6.7 years and those in economic fields 6.1 years. Studies in economic fields thus last about two years longer at universities than at *Fachhochschule*; in engineering fields, this difference is somewhat more than two years.

Chart 7
Duration of Study in Respective Fields - Graduates from Fachhochschulen 1986 (range of means among Fachhochschulen providing respective course programmes)



Mean/Federal Republic of Germany (excluding Baden-Württemberg and Bayern)

* Including practical period
** Practical period not included

Source: Wissenschaftsrat, 1989, p. 7.

The total number of foreign students at institutions of higher education in the Federal Republic of Germany was 22,000 in 1960, 28,000 in 1970, 58,000 in 1980 and 81,000 in 1987. The proportion of foreign students among all students enrolled was 7.5 percent in 1960. After a drop to 5.6 percent in 1970, it remained more or less constant: 5.5 percent in 1980 and 5.7 per cent in 1987 (see Table 6 above). Of all foreign students enrolled 1987, 47 percent had their residence in the Federal Republic of Germany (i.e. did not come to the Federal Republic of Germany for the purpose of study; see Bundesminister für Bildung und Wissenschaft, 1988, pp. 176-7).

Table 21

Foreign Students 1987 according to Type of Higher Education and Nationality

Land of Origin	Foreign Students				
	Total		of which in		
			Universities	Colleges of Art and Music	Fachhochschulen
	Number	Per Cent	Number		
Europe	42677	52,6	33273	1107	8297
EC-Member States	19458	24,0	16114	490	2854
Belgium	523	0,6	394	16	113
Denmark	262	0,3	215	8	39
France	2650	3,3	2086	89	475
Greece	6208	7,7	5598	51	559
Great Britain[1]	2002	2,5	1577	83	342
Ireland	214	0,3	196	10	8
Italy	2307	2,8	1795	87	425
Luxembourg	1067	1,3	950	25	92
Netherlands	1949	2,4	1486	70	393
Portugal	472	0,6	349	10	113
Spain	1804	2,2	1468	41	295
Other Countries	23219	28,6	17159	617	5443
Bulgaria	121	0,1	105	7	9
Finland	691	0,9	619	20	52
Iceland	219	0,3	182	17	20
Yugoslavia	2153	2,7	1614	65	474
Norway	804	1,0	757	23	24
Austria	4240	5,2	3360	101	779
Poland	1577	1,9	1322	85	170
Romania	223	0,3	168	26	29
Sweden	434	0,5	376	18	40
Switzerland	1259	1,6	918	145	196
USSR	87	0,1	76	3	8
Czechoslovakia	583	0,7	463	24	96
Turkey	9790	12,1	6282	55	3453
Hungary	344	0,4	280	26	38
Cyprus	658	0,8	606	2	50
Other Countries	36	0,0	31	–	5
Africa	4774	5,9	3854	54	866
Egypt	761	0,9	705	15	41
Ethiopia	431	0,5	354	1	76
Algeria	300	0,4	189	14	97
Ghana	282	0,3	234	1	47
Kamerun	311	0,4	253	3	55
Marocco	294	0,4	240	1	53
Nigeria	235	0,3	183	1	51
Tunisia	485	0,6	427	–	58
Other Countries	1675	2,1	1269	18	388

[1] Including Northern Ireland

Table 21 (cont.)

Foreign Students 1987 according to Type of Higher Education and Nationality (cont.)

Land of Origin	Foreign Students				
	Total		of which in		
			Universities	Colleges of Art and Music	Fachhochschulen
	Number	Per Cent	Number		
America	7970	9.8	6876	295	799
Argentina	277	0.3	230	23	24
Bolivia	240	0.3	154	4	82
Brazil	633	0.8	553	43	37
Chile	512	0.6	432	22	58
Canada	424	0.5	370	21	33
Columbia	370	0.5	306	5	59
Mexiko	256	0.3	234	8	14
Peru	435	0.5	340	9	86
USA	4183	5.2	3770	144	269
Venezuela	134	0.2	96	6	32
Other Countries	506	0.6	391	10	105
Asia	24316	30.0	18807	677	4832
Afghanistan	681	0.8	531	2	148
China (Taiwan)	658	0.8	608	34	16
China	1877	2.3	1805	29	43
India	565	0.7	503	2	60
Indonesia	2131	2.6	1311	24	796
Iraq	386	0.5	319	8	59
Iran	8793	10.8	6128	40	2625
Israel	808	1.0	749	20	39
Japan	1158	1.4	792	348	18
Jordan	963	1.2	855	1	107
Korea (Republic)	3340	4.1	2871	336	133
Lebanon	307	0.4	246	2	59
Pakistan	199	0.2	154	–	45
Syrian	450	0.6	385	–	65
Thailand	218	0.3	171	3	44
Vietnam	1052	1.3	599	3	450
Other Countries	730	0.9	580	25	125
Australia and Ozeania	160	0.2	109	23	28
Australia	134	0.2	89	18	27
Other Countries	26	0.0	20	5	1
All Countries[1]	81090	100	63731	2365	14994

[1] Including cases where no data are available

Source: Federal Ministry of Education and Science, 1988a, pp. 88-9.

Of all foreign students at German institutions of higher education in 1987, 78.6 percent were enrolled at universities, 2.9 percent at art colleges and 18.5 percent at *Fachhochschulen*. Or from another angle: 6.4 percent of students at universities were foreigners; the respective quotas were 12.1 percent at art

colleges and 5.4 percent general at *Fachhochschulen* (no foreign students were enrolled at *Verwaltungsfachhochschulen*).

The nationalities of foreign students are presented in Table 21. There is a substantial concentration of foreign students from Turkey, Iran and Greece. Also the Republic of Korea and Indonesia are frequently named as countries from which relatively many foreign students come. The number of students from Austria and from the U.S. each higher than the highest number is from EC countries (other than Greece).

The total number of degrees awarded at institutions of higher education (excluding doctoral degrees for those having been granted a prior degree) was 44,000 in 1960 and 78,000 in 1970. It increased to 110,000 in 1975, 113,000 in 1980 and 136,000 in 1986. The total number of *Fachhochschule* degrees (including corresponding degrees at comprehensive universities and degrees conferred at the completion of study at *Verwaltungsfachhochschulen*) was 50.362 in 1986, i.e. about 37 percent of all degrees (except the above-named doctoral degrees). The quota is higher than that of new entrant students (about 30 % in the early 1980s). This does not indicate, however, a substantially higher drop-out rate at universities than at *Fachhochschulen*; rather one has to bear in mind that - due to the different duration of studies - the number of graduates at universities and *Fachochschulen* each have to be viewed in relation to different years of entry at a period of rapidly increasing absolute number of students in the early eighties.

Among all university-level degrees (except for doctoral degrees) awarded in 1986, 10 percent were granted in engineering fields and 21 percent in economic and social science fields. The corresponding quotas at *Fachhochschulen* were 40 percent and 47 percent. The absolute figures are presented in Table 22.

The quota of German students enrolled at universities who had already completed a course programme, remained constant at about 12-13 percent; it was 12.8 percent in 1986/87. There were 2.3 percent were enrolled as graduate students, 2.1 percent in other advanced or further education studies, 6.0 percent were enrolled in another first-degree programme. No data are provided how many of the latter are transfers from *Fachhochschulen* to universities.

The number of doctoral degrees awarded in 1986 to persons who previously already had been awarded a university degree corresponds to about 17 percent of first university degrees. If we exclude medical fields in which a doctoral degree does not necessarily require a few years of additional study and research, the ratio of doctoral degrees to first university degrees is about 10 percent.

Table 22
Examinations Passed at Universities and Fachhochschulen 1965 - 1987 (percentage)

Type of institution, examination and field		1965[3] Total	1965[3] of which females	1970[3] Total	1970[3] of which females	1975 Total	1975 of which females	1980 Total	1980 of which females	1987 Total	1987 of which females
Diploma, State and Magister examination		36	17	36	17	32	18	42	28	50	36
of which:											
Humanities		3	28	3	32	4	42	6	50	8	56
Social sciences		12	11	13	11	10	12	13	25	14	33
Natural sciences		6	24	6	22	5	15	6	25	8	33
Medical fields		7	34	8	27	6	22	8	29	9	39
Agriculture		1	3	1	17	1	26	2	39	2	44
Engineering		8	3	6	4	5	4	6	7	6	9
Fine arts		-	-	-	-	1	47	1	49	2	53
Teacher examinations		36	57	32	56	38	56	26		12	65
Fachhochschule examinations[1]		28	1	32	10	30	21	32	27	38	32
Total[2]	Percentage	100	27	100	27	100	34	100	35	100	38
	Absolute	54,832	15,043	68,102	18,507	105,915	35,789	109,887	38,829	138,805	52,740

1 1965 and 1970: Examinations at Engineering Schools.
2 Doctoral examinations not included.
3 Only Germans.
Source: Own calculations, based on: Wissenschaftsrat: Zur Lage der Hochschulen Anfang der 80er Jahre. Quantitative Entwicklung und Ausstattung. Statistischer Anhang, Köln 1983, pp. 85-91 and p. 95; Statistisches Bundesamt: Fachserie 11, Reihe 4-2, 1975, 1980 and 1987.

Table 23
Educational Attainmant of Labour Force[1] by Sex 1961-1982

Level of education	1961	1970	1976	1982
Male				
Unskilled and semi-skilled labour	90.8	82.5	27.1	19.1
Skilled labour: apprenticeship training			55.4	56.5
Skilled labour: higher vocational training	5.7	10.9	8.7	8.9
Graduates from short-cycle institutions		2.3	3.0	3.6
University graduates	3.6	4.3	5.4	6.4
Open/others	-	-	0.4	5.5
Total	100.0	100.0	100.0	100.0
Total in thousands	16.890	17.075	16.172	16.592
Female				
Unskilled and semi-skilled labour	92.0	87.2	45.4	33.8
Skilled labour: apprenticeship training[2]			46.5	51.3
Skilled labour: higher vocational training	6.3	8.9	2.5	2.9
Graduates from short-cycle institutions[3]		0.1	0.9	1.2
University graduates	1.7	2.8	4.2	5.2
Open/others	-	0.1	0.5	5.6
Total	100.0	100.0	100.0	100.0
Total in thousands	9,932	9,535	9,580	10,182

(Table cont.)

(Table 23 cont.)

Level of education	1961	1970	1976	1982
Total				
Unskilled and semi-skilled labour	91.1	84.2	33.9	24.7
Skilled labour: apprenticeship training			52.1	54.5
Skilled labour: higher vocational training	6.0	10.5	6.4	6.6
Graduates from short-cycle institutions		1.5	2.2	2.7
University graduates	2.9	3.8	5.0	5.9
Open/others	-	0.0	0.4	5.6
Total	100.0	100.0	100.0	100.0
Total in thousands	26,527	26,610	25,752	26,774

1 1961 and 1970: Labour force including unemployed; 1976 and 1982: exluding unemployed
2 1976 and 1982: including internships
3 1961 and 1970: including engineering schools
Source: Tessaring, 1988b, p. 128; Teichler, 1986a, p. 77

The total number of university-trained persons in the labour force of the Federal Republic of Germany was less than 800,000 in 1961, about 1 million in 1970 and about 1.6 million in 1982, as Table 23 shows. The corresponding figures of persons trained at *Fachhochschulen* or their predecessor institutions were about 400,000 in 1970 and more than 700,000 in 1982. The quota of university-trained persons among the labour force increased from 3.8 percent in 1970 to 5.9 percent in 1982. The corresponding quota of persons trained at *Fachhochschulen* increased during the same period from about 1.5 to 2.7 percent.

The total number of persons having been awarded a higher education degree is expected to surpass 4 millions, i.e. about 15 to 16 percent of the labour force, in the year 2,000, (cf. Tessaring, 1988b). About a third of them are expected to have been awarded a *Fachhochschule* degree.

5

Teachers

5.1 Qualitative and Structural Overview

Statistics on staff at institutions of higher education in the Federal Republic of Germany in 1986 give a total number of 336,966 persons. As Table 24 shows, 33,911 (10.1 %) were active at *Fachhochschulen*.

Of the staff at universities (including art colleges), 35,273 were part-time staff (11.6%). At *Fachhochschulen*, the quota of part-time staff was much higher: 38.4 percent (13,026 persons).

Among full-time staff at universities (267,813), 85,618 (32.0 %) were academic staff (including artistic staff) and 182,195 (68.0 %) other staff (administative, technical etc.). Of the full-time staff at *Fachhochschulen* (20.885), half each were academic (10,437; 50.0 %) and other staff (10,448; 50.0 %).

In comparing staff data between universities and *Fachhochschulen*, one should bear in mind that a third of the full-time staff at universities are active in the fields of medicine and dentistry which include staff of hospitals serving practical purposes beside research and teaching. The number of full-time staff at universities excluding medical fields was 180,232 in 1986, among them 64,515 (35.8 %) academic staff and 115,717 (64.2 %) other staff.

It should be noted that these figures comprise also staff not on regular positions, but rather paid by external funds. The total number of academic positions at universities (for regular staff) was 70.394 in 1985 (Wissenschaftsrat, 1988, pp. 210-1), whereas the number of employed full-academic staff members in that year was 82,639. Thus, at least (exact data are not available, because some staff positions might be vacant) 14.8 percent of academic staff at

Table 24

Staff according to Rank and Type of Institution of Higher Education

Year	Staff						
	General Total	of which					
		Full-time Staff					
		Total	Academic and Creative Arts Staff				
			Total	Students per Person	Professors	Academic and Artistic	Teachers with Special Assignment
	Fachhochschulen						
1972	18746	13549	7825	14	6711	706	408
1975	20883	14419	8147	18	7171	595	381
1976	22212	15308	8492	18	7449	545	498
1978	24479	16505	8918	19	7939	558	421
1979	25086	16842	8986	20	7979	490	517
1980	26986	17303	9221	22	7909	490	822
1981	28825	18209	9652	23	8279	353	1020
1982	29778	19215	10063	25	8433	341	1290
1984	31585	20045	10204	29	8713	316	1175
1985	33235	20551	10277	29	8768	306	1203
1986	33911	20885	10437	30	8950	277	1240
	All Institutions of Higher Education						
1972	218425	173818	65803	10	20771	41056	3976
1975	270212	216257	76150	11	24922	48311	2917
1976	276509	218819	76693	11	25526	48078	3089
1978	294694	223430	79203	12	27377	49386	2440
1979	309549	235238	81656	12	28087	51138	2431
1980	315437	245815	85234	12	28220	53602	3412
1981	325052	257033	87864	13	29004	54738	4122
1982	311460	265863	89603	13	29331	56160	4114
1984	319292	274412	91373	14	30221	57036	4118
1985	327055	279109	92916	14	30265	57848	4802
1986	336996	288698	96055	14	30522	59851	5681

Table 24 (cont.)

Staff according to Rank and Type of Institution of Higher Education

Staff	of which						Year
	Part-time Staff						
Administrative Technical and other Staff	Total	Academic and Creative Arts Staff				Administrative Technical and other Staff[1])	
		Total	Professors	Academic Assistents	Staff with Teaching Commission		
						Fachhochschulen	
5725	5198	5048	3	26	5019	150	1972
6272	6464	6157	3	52	6102	308	1975
6816	6904	6324	2	33	6289	580	1976
7587	7974	6798	7	23	6768	1176	1978
7855	8245	7129	19	40	7070	1116	1979
8082	9683	8464	39	36	8389	1219	1980
8557	10616	9668	153	413	9103	948	1981
9152	10563	10402	95	458	9849	161[1])	1982
9841	11540	11221	93	1083	10045	319	1984
10274	12684	12362	98	1520	10744	322	1985
10448	13026	12487	125	1434	10928	539	1986
						All Institutions of Higher Education	
108015	44610	22357	2223	6166	13968	22253	1972
140107	53959	27798	2648	6207	18943	26161	1975
142126	57691	30061	3540	7125	19396	27630	1976
144227	71266	33133	4049	7644	21440	38133	1978
153582	74312	34425	3902	9477	21046	39887	1979
160581	69622	42149	4895	13797	23457	27473	1980
169169	68020	41917	4514	13199	24204	26103	1981
176260	45597	41139	4392	11698	25049	4458[1])	1982
183037	44882	43194	4672	12185	26337	1688	1984
186194	47945	46096	5264	13199	27633	1849	1985
192643	48299	46148	5454	12525	28169	2151	1986

[1]) From 1982 onwards, not including ouxiliary student personnel

Source: Federal Ministry of Education and Science, 1988a, pp. 98-9.

universities was paid by other funds (research funds, income from services etc.). At *Fachhochschulen*, the number of academic positions was 9,089 and the actual number of academic staff 10,277: at least 11.6 percent was externally funded.

An overview on the structure of academic staff in the year 1985 is provided in Table 25. In this case, comprehensive universities are taken as a separate category, because they combine the functions of universities and *Fachhochschulen*; some of their professors have a higher teaching load than university professors, and research is not part of their duties.

Among full-time staff, the total number of professors at universities was 17,125. The ratio of other academic staff (altogether 56,745) to professors was 331 : 100. Again, we have to bear in mind the exceptional structure of the university hospitals. The ratio of other academic staff positions to professor positions (excluding those paid by research funds or other income) at universities in 1985 was 351 : 100 in medical fields, 206 : 100 in engineering, 181 : 100 in economic fields, 173 : 100 in natural sciences, 153 : 100 in agricultural fields, 145 : 100 in law, 116 : 100 in humanities, and 188 : 100 in all disciplines (ibid., p. 209).

The total number of professors at comprehensive universities was 2,146. The ratio of other academic staff (altogether 3,175) to professors was 148 : 100. Even if we exclude medical disciplines, the ratio of other academic staff to professors is substantially higher at universities (about 250 : 100) than at comprehensive universities.

At *Fachhochschulen* (excluding *Verwaltungsfachhochschulen*), the total number of professors was 8,360. The ratio of other academic staff to professors was 8 : 100. The academic staff at *Fachhochschulen* comprises almost exclusively professors. *Fachhochschulen* are neither expected to train junior academic staff, nor are *Fachhochschule* professors supported in their regular teaching (and possibly research function) by other academic staff. In this context we note that more than 90 percent of academic full-time staff at *Fachhochschulen* were permanently employed (civil servants or employees without any time-limitation stated in the contract), whereas only 45 percent of academic full-time staff at universities were permanently employed (less than a third of the full-time academic staff not in a professor position; cf. ibid., p. 207).

Among university professors, only 5.0 percent were women - among the highest-ranking professors (*C4*) only 2.3 percent. Also among *Fachhochschule* professors, only 5.4 percent were women. The quotas were higher among other academic staff - 19.7 percent at universities and 27.7 percent at *Fachhochschulen* (Bundesminister für Bildung und Wissenschaft, 1988, pp. 204-5),

but still substantially lower than the quota of women among university graduates.

Table 25
Academic Staff of Universities, Comprehensive Universities and Fachhochschulen by Type of Position and Full-Time/Other Assignment 1985

Title	Staff category	Total	Among them: at universities	at *Gesamthochschulen*	at *Fachhochschulen*
Fulltime academic and artistic staff					
Professoren	C4	9,901	8,304	741	7
Professoren	C3	11,831	5,500	833	4,202
Professoren auf Dauer	C2	7,768	2,770	530	3,919
Professoren auf Zeit	C2	902	551	42	232
Hochschulassistenten	C1	2,195	2,064	113	-
Oberassistenten/-ingenieure	H2/A14	242	228	14	-
Wissenschaftliche Assistenten	H1	844	722	115	-
Wissenschaftliche Assistenten	A13	256	244	-	-
Ltd. Akad./Wiss. Direktoren	A16	47	31	1	1
Akad./Wiss. Direktoren	A15	948	855	28	1
Akad./Wiss. Oberräte auf Dauer	A14	3,655	3,267	293	-
Akad./Wiss. Oberräte auf Zeit	A14	167	162	-	-
Akad./Wiss. Räte auf Dauer	A13	2,049	1,805	141	28
Akad./Wiss. Räte auf Zeit	A13	2,599	2,563	36	-
Wissenschaftl. u. künstlerische Mitarbeiter auf Dauer	BAT I-II	8,145	7,441	339	106

(Table 25 to be continued)

Table 25 (cont.)

Title	Staff category	Total	Among them: at universities	at *Gesamthochschulen*	at *Fachhochschulen*
Wissenschaftl. u. künstlerische Mitarbeiter auf Zeit	BAT I-II	36,566	34,621	1,743	13
Ober-/Studiendirektoren/Studienräte	A16-A13	1,412	839	58	99
Fachlehrer, technische Lehrer	A12-A10	423	75	34	196
Lektoren	A13/BAT	447	406	11	1
Sonstige Lehrkräfte f. besondere Aufgaben	BAT	2,520	1,425	249	285
Total		92,916	73,870	5,321	9,089
Other academic and artistic staff					
Emeriti		919	859	3	1
Gastprofessoren, Gastdozenten		304	174	21	17
Honorarprofessoren		1,344	1,174	22	64
Privatdozenten, apl. Professoren		2,697	2,696	-	-
Lehrbeauftragte		27,633	12,077	1,630	3,403
Tutoren		4,292	3,036	9	807
Wissenschaftliche Hilfskräfte mit Abschlußprüfung		8,907	7,465	664	713
Total		46,096	27,481	2,349	10,005

Source: Wissenschaftsrat, 1988, p. 208.

The ratio of students to academic staff positions at universities was 15 : 1 in 1960. During the subsequent five years, the number of academic staff positions was doubled; consequently the student-academic staff ratio went down to 9 : 1 in 1965. It remained constant until 1973, because the number of academic staff

positions was increased in accordance with the rising student numbers during that period (see Huber/Portele, 1983, pp. 198-9). Thereafter, the increase of academic staff positions (cf. Wissenschaftsrat, 1988, p. 400) was less than that of students. The student-academic staff position ratio increased to 12 : 1 1980 and to 15 : 1 in 1987 - as high as it was 1960. If we exclude medical fields, the student : academic staff position ratio was 19 : 1 in 1987 (in this paragraph, comprehensive universities are included).

Predecessor institutions of *Fachhochschulen* had a student-academic staff position ratio of 20 : 1 in 1960. In the context of the up-grading process, the number of academic positions substantially increased. The student-academic staff position ratio was lowest in 1972 (13 : 1). Until 1979, it had risen again to 20 : 1. Until 1987, it finally increased even to 30 : 1 (excluding *Verwaltungsfachhochschulen*).

The differences between the academic staff structure of universities and *Fachhochschulen* hardly allow any comparison. We might, however, estimate the number of students per course. In our calculation we assume that university professors teach 6 hours per week on average and other academic full-time as well as part-time staff 2 hours (a cautious estimate; cf. Alewell, 1987), that *Fachhochschule* professors teach 16 hours and other full-time academic as well as part-time staff 4 hours. Additionally we assume - according to the students' surveys reported above - that university students take 17 hours and *Fachhochschule* students 25 hours per week. The average number of participating students per course thus estimated was 60 at universities (about 80, if we excluded medical disciplines) and 72 at *Fachhochschulen*. The average number of students at classes does not seem to differ substantially between the two major institutional types. One has to take into consideration that the lectures with large numbers of students on the one hand and small-size seminars are customary at universities, whereas most *Fachhochschulen* offer courses in classes of 30 or some more students.

5.2 Career, Status and Function

For appointment as professors both at universities and *Fachhochschulen*, candidates are expected to have acquired a doctoral degree and to provide evidence of teaching or training experience. Additionally, candidates for a university professorship are expected to have pursued research beyond the doctorate and to have attained the *Habilitation* or equivalent scholarly achievements within or outside higher education. On the other hand, candidates for a *Fachhochschule* professor position are expected to fulfil "particularly achievements with regard to the application and development of scientific findings and

methods in at least five years of professional activity, of which a minimum of 3 years shall have been spent outside higher education" (Framework Act for Higher Education, § 44).

In a typical academic career, a student will acquire the first university degree after about 6 years of study. Less than one out of seven graduates will head for a doctoral thesis. During a period of 3-5 years, he or she might be a doctoral student, possibly supported by a doctoral fellowship, an academic supportive staff member position, a research staff member position financed by external research funds etc. Upon completion of a doctoral degree, again about one out of seven will eventually become a university professor. He or she might be a university assistant, a research staff member financed by external research funds, etc. and eventually attain the *Habilitation* after about 5 years or more. It might take a few further years - a period for which recently specific positions were established and special research grants were introduced, until he or she might receive a "call" to a professor position (cf. Teichler, 1986a, pp. 147-156). Prospective *Fachhochschule* teachers might have turned to professional activities outside higher education upon completion of a doctoral degree. If they had continued an academic career, they are expected, as already stated above, to have acquired at least three years of professional experience outside the domain of research.

The recruitment and appointment procedures are more or less the same at universities and *Fachhochschulen*. Vacancies of professor positions are publicly announced. The institution of higher education in charge will, upon a hearing of the most qualified candidates, present a list of the three most qualified candidates, and the resepctive state ministry of education will appoint the persons on top of the list or another person on the list. Or, in exceptional cases, the ministry might call for a new list of candidates or might even appoint someone who had not been proposed.

At universities, persons previously employed at the university offering such a position will be appointed only in exceptional cases. Also, there are no promotion schemes from a lower-ranking professor position to a higher-ranking professor position. Finally, university professors in the highest professorial rank are entitled to negotiate about salary supplements or other resources on the provision that there were "called" externally. This system of promotion and appointment encourages mobility and helps to counterbalance institutional hierarchies. At *Fachhochschulen*, however, a person on a lower-ranking professor position might be promoted to the higher-ranking professor position. Contrary to university professors, those in the highest professorial rank at *Fachhochschulen* are not entitled to negotiate salary supplements or resources.

Of all university professors (excluding comprehensive universities) in 1985, 49 percent were in category *C4*, i.e. the full professor position (traditionally

called *ordentlicher Professor*); 32 percent were in category *C3* and 19 percent in category *C2* (cf. Table 25). According to the 1985 revision of the Framework Act for Higher Education, the *C2* position for university professors was replaced by non-professorial positions (*Ober-Assistent*, *Ober-Ingenieur* and *Dozent*) for persons having attained a *Habilitation* as a rule. At *Fachhochschulen*, no *C4* category is foreseen (actually, 0.1 % of *Fachhochschule* professors hold such a position). Rather, about half of the professor positions each are of the *C3* and the *C2* category.

Table 26
Salary of Academic University Staff in the Federal Republic of Germany 1983 (Index*)

Scale based on length of service	Academic staff members (Wissenschaftliche Mitarbeiter)***			University assistants	Professors		
**	A 13	A 14	A 15	C 1	C 2	C 3	C 4
1	45.7	46.7	50.9	-	45.8	50.0	62.6
5	51.6	54.3	59.3	53.2 + +	55.2	60.7	73.3
10	59.0	63.9	69.9	56.2 + + +	66.9	74.0	86.6
15 +	64.9	71.5	80.4	-	78.7	87.3	100.0

* 100 = Maximum salary of a full professor, without supplements granted on occasions of being "called" repeatedly, gross salary (before taxes). All figures are taken for married persons, two dependent children.

** Promotion from one scale position to the next after 2 years of service each. Education and previous employment considered to be prerequiste for the position is equivalent to years of service in the position under consideration.

*** A 13 = starting rank, A 14: advanced rank, A 15: only granted for few positions (most academic staff members are not employed as civil servants and not paid on this civil servants' pay scale, but rather on a civil employees' scale, which is more or less equal in terms of net income.

\+ In the case of A 13 and A 14, the maximum scale position is 14.

\+ + There are only three ranks of assistants' salaries of which the figure represents the lowest.

\+ + + The highest rank of assistents' salary (cf. above).

Source: Teichler, 1986a, p. 158.

As Table 26 shows, the maximum salary of a *Fachhochschule* professor is about 13 percent lower than that of a universitiy professor on a regular pay scale. In 1989, the annual gross salary of a university professor in the highest category (*C4*), who is married, responsible for two children and about 50 years old, is about 115,000 DM. The annual salary of a corresponding *Fachhochschule* professor in the highest category as well as that of a university professor in the second category (*C3*) is about 100,000 DM. Finally, the corresponding salary of the *C2* category is about 91,000 DM. As the university professor in the *C4* might negotiate salary supplements (additional 10 percent at the first negotiation), the actual average income difference between university professors and *Fachhochschule* professors is higher.

The teaching load during a semester week is 18 hours for *Fachhochschule* professors and 6-8 hours for university professors. Research is part of the regular work of a university professor, for which in principle as much time should be available as for teaching. The teaching load of *Fachhochschule* professors can be reduced for research and developmental work, but such a reduction is rare. University professors might take a sabbatical leave for research every 5th to 7th semester. *Fachhochschule* professors could take a sabbatical for applied research or in order to update professional practice. Sabbaticals of *Fachhochschule* professors have in fact remained rare.

More than 95 percent each of university professors and *Fachhochschule* professors are permanent civil servants. Contracts for a limited time-period and/or employee status are exceptions. On the other hand, more than two thirds of other academic staff are employees or civil servants for a limited time-span (contracts of up to at most six years in the same position).

There are various ways of extending teaching provisions beyond that provided by academic staff holding regular positions at institutions of higher education. The most frequent ones are the following:

- University staff funded by external resources might receive a (part-time) contract as lecturers (*Lehrbeauftragte*) or might be partially relieved from their main tasks in order to teach.
- Practitioners from other occupational fields might also be hired as part-time lecturers. The ratio of all *Lehrbeauftragte* to professors was 71 : 100 at universities and 101 : 100 at *Fachhochschulen* in 1985, as Table 25 shows.
- Recent graduates might get short-term contracts for serving as research or teaching assistants (*Wissenschaftliche Hilfskräfte*). The ratio of these persons to professors was 44 : 100 at universities and 9 : 100 at *Fachhochschulen* in 1985.
- External persons in high professional and academic positions might be appointed to *Honorarprofessoren*. They are obliged to teach without being

remunerated. The ratio of Honorarprofessoren to regular professors was 7 : 100 at universities and 1 : 100 at *Fachhochschulen* in 1985 (cf. Table 17).

A substantial proportion of academic staff is involved in contractual research and development outside their major function. Any research for which a honorarium is payed, is legally considered to be a side-job, which the university professor in most cases has to declare only, but for which the *Fachhochschule* professor might need approval. For example, more than a third of all further education courses for professionals are taught by academic staff of institutions of higher education in the framework of other institutions, i. e. as side-jobs. Recent calls for increased activities in favour of "knowledge transfer" are likely to have increased the amount of applied research and consultancy activities. According to a recent survey, about 10-15 percent of *Fachhochschule* professors are engaged in research and development activities (cf. the report in Oehler, 1988, p. 113). No corresponding data are available for academic staff at universities, but certainly the respective proportion will be at least as high.